The miscellaneous autobiographical manuscripts of John Edward Gray (1800–1875)

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Introduction

Of the considerable volume of writings by John Edward Gray, for fifty years an official of the British Museum and for thirty-five its Keeper of Zoology, the autobiographical manuscripts comprise the most important source material for an understanding of his character and for seeing what sustained the impetus in his work. They form an essential complement to his scientific and

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historical output for which he himself had compiled a *List of Books, Memoirs and Miscellaneous Papers* (Gray, 1875) and in which nearly eleven hundred separate titles are given.

The corpus of Gray's autobiographical manuscripts may be divided, for convenience, into two classes. Into the first fall the more formal passages written, as it is believed, in response to requests. One of the longer of these appeared in final form in *Portraits of Men of Eminence in Literature, Science and Art* (Reeve, 1863; Gunther, 1974 : 72–76), contributed for his friend Lovell Reeve (1814–1865), the publisher and conchologist. The preparation for this seems to have taken the form of an *Autobiographical Journal* (Gray, *c.* 1862), followed by two or three drafts, but these suffer from the constraints usual in an author writing about himself for publication.

The second category, which gives the title to this paper, comprises a large quantity of miscellaneous manuscripts housed in the General Library of the British Museum (Natural History) (Gray, *c.* 1862–74). The manuscripts vary in length from a pensée of a few words to a dozen folios of the blue-grey half foolscap sheets that Gray was in the habit of using in the 1860s for his zoological work. About half of them are written in his own hand, the balance being dictated to his assistants; whoever wrote them there is no perceptible change of style and a correction or pagination in Gray's left hand implies his agreement to the text.

The dating of most of these fragments is open to conjecture. It is assumed that they were written in the decade between the publication of Reeve's *Men of Eminence* in 1863 and the last months of 1874. For Gray it was a decade of intermittent illness of increasing severity and he probably turned to jotting personal reminiscences during periods of incapacity, which may account for much of the repetition (like the claim relating to Penny Postage which seems to have worried him). Some of the later fragments can be dated because they were dictated either to E. A. Smith (1847–1916), appointed to the Museum in 1867 for the mollusca and lower animals, or to E. J. Miers (1851–1930), appointed in 1872 for the crustaceans, and purposely to serve as an amanuensis. More precisely dated is almost the last of the fragments disputing Francis Galton's (1822–1911) conclusions in *English Men of Science* (Galton, 1874), which loses nothing of its force coming from an aged invalid suffering periodic loss of powers.

Why these manuscripts came to survive is uncertain. Some were evidently available to the writers of the obituaries. The majority came into the hands of B. B. Woodward (1853–1930) who, as Librarian at the British Museum (Natural History) between 1881 and 1920, assembled them into an album bearing the title *Gray, J. E. Miscellaneous Papers* (Gray, *c.* 1862–74) preserved in the Museum's General Library. A number were also found among Albert Günther's papers in 1965, when the present writer was engaged on an account of Günther's life (Gunther, 1975) and these were added to Woodward's album. The most important item of all, the *Autobiographical Journal* (Gray, *c.* 1862), must have remained with the family, since it was presented to the Museum in 1970 by Gray's collateral descendant, Professor Peter Gray (b. 1908), then at the University of Pittsburgh.

Although a biographer cannot regret the circumstances that deflected Gray from continuing to multiply the immense number of his scientific papers, it is a pity that he gave so little background to his life and times, and even less to the memories his parents must have bequeathed to him of the eighteenth century. And why does he say so little about his mother? Self-centred as he was, it is also strange that a man as conscious as he was of his place among the naturalists of the day should have neglected to date the events he describes.

The manuscripts do, however, show clearly what were the principal influences in Gray's life, what gave it impetus, and what were the aims he set out to achieve. To understand them it is necessary to go back to the years of childhood in Chelsea (Gunther, 1975 : 1–20), and to the relations between Samuel Frederick Gray (1766–1828) and his two sons, Forfeit (1798–1872) the elder, and John Edward. It was fortunate for the lives of both John and his father that there was clearly a marked harmony of temperament between them. Also that John had the intellect to respond to his father's interests, so that in the early house-bound years of John's invalidism, his father's influence took root.

Between Forfeit and his father there was evidently no such rapport; and the influence of the elder brother worked as a subconscious challenge to the younger and brought out his combativeness. While Forfeit went off to school, which the parents could not afford for two boys anyway,

John Edward Gray, c. 1868. From a photograph in an album of the Literary and Scientific Portrait Club, edited by James S. Bowerbank, in the Linnean Society of London Library. (On table: Lindley, J. 1849. *Economical Botany*; jars (left) Neotropical anuran, (centre) Sea mouse, (right) unclear.)

or to play with his friends, John sat in an invalid's chair having to content himself with the *Encyclopaedia Britannica*; every meal time must have left a sense of deprivation from the food he could not stomach; and the realization of his greater intelligence would increase his determination to do what Forfeit refused to. When later his brother demurred at taking over a night watch in a bookstore in which his father had an interest, it was John who went in his place; and it was John who took over as assistant in the Wapping pharmacy when Forfeit left for the Apothecaries' Company. Therefore, if we are to seek in John's life for the source of combativeness and the need to justify himself, we can look to the deprivations of childhood and the influence they wrought on his character. Conscious as a young man of his intellectual powers, his early failure to secure election to the Linnean Society (Reeve, 1863 : 114) and later, opposition within the Museum or neglect by the academic world, must have brought back all the sublimated frustrations of childhood, and redoubled the determination to succeed.

The conflict between father and elder son is reflected in Forfeit's life, from his failure to make anything of the Apothecaries job, or even taking its licentiate, to his failure in a partnership as 'S. F. Gray, Chymist and Drugist' which landed him in the debtors' prison. It says much for John's charity in later years that he seems to have put several jobs in his brother's way, like the trip to the continent (Gunther, 1977) with J. G. Children (1777–1851), the Keeper of the British Museum's natural history collections where John was working. We may suppose that John drew his brother, as an apiarist, on to the Juror's Panels at the Great Exhibition of 1851 and again in 1860 and encouraged his contributions to the *Gardener's Chronicle* (Anon., 1872 : 430). Who else was there to pay for his brother's release from prison? John, on the other hand, was constantly working with his father; as a student taking over his father's lectures, collecting receipts from Mr Willat's drugstore in the City as material for his father's *Pharmacopeia* (Gray, S. F. 1818), or collaborating on the *Natural Arrangement* (Gray, S. F. 1821). During long intervals of illness and frustration, Samuel Frederick perhaps found solace in what John was contributing towards his unfinished work. Weakness of health prevented steady application. Politically a radical non-conformist, he was cold shouldered, or felt himself to be, by the naturalists of the day; his important botanical work was rejected, others making capital, scientific and financial, out of his scientific publications; and there was the culminating failure of his elder son, Forfeit.

If John inherited his intellectual potential from his father, the pattern of its expression may have come from his mother, of whom little is known. If his mother's father, as a picture dealer in Maiden Lane, Covent Garden (Gray, *c.* 1862: f. 3), ran a successful business, John's acumen and organizing ability could have come from that side. That he was endowed with a quick and versatile brain capable, before illness dulled it, of grasping the essence of any problem, scientific, social, financial or other, is abundantly clear. It was a mind that had been prematurely developed under conditions of childhood delicacy, in a confined home life and a precocity stimulated by his father, a man of exceptional intellect. Adolescence found Gray a student in advance of his years and one his elders found responsive. If the portrait of him at the age of 19 is any guide (1), and his looks in later life seem to confirm this, his was an attractive personality.

His father's social circle of radical intelligensia provided a stimulus that became John Edward's nature, and he thrived in an environment of naturalists (Gray, *c.* 1862 : f. 12). The first of his friends was William Salisbury (d. 1823), the botanist, a family friend from Chelsea days, who invited Gray to attend his lectures at the Maze Pond medical school, which he was later to take over. The next of his friends, with whom he went on his botanical rambles from Wapping (Gray, *c.* 1862 : f. 27), was the entomologist James Francis Stephens (1792–1852), who introduced him to William Elford Leach (1790–1836), then assistant to the Keeper of the natural history collections at Montagu House (Reeve, 1863 : 114). Of all those whom Gray was to meet in his professional life, Leach's influence was the greatest. Ten years older than Gray, he was to assume the role of the inspiring tutor to the promising pupil; he was to wean Gray from botany to zoology and to give him a future he could not have realized in medicine.

At that time, Leach was contributing to the outstanding Supplement of the *Encyclopaedia Britannica*, issued in six volumes between 1815 and 1828. Its aim was to make good the omissions and defects of the 4th to 6th editions (1810, 1815 and 1823), and to bring the arts and sciences up to date. It was the first edition of the *Encyclopaedia* to name its authors. Although Leach was

among the eminent naturalists on the list of contributors, it is not certain which articles he was asked to do, since the only one completed by him, before illness overcame him, is that on the *Annulosa* (signed 'V'), the others on *Conchology* and *Mollusca* being taken over by the Rev. Dr Fleming, D.D., F.R.S. (1785–1857) and signed 'QQ'.

Leach's inspiration meant much to a young man of Gray's inclinations at that period of his life: to have contact with a brilliant, original mind; to be given the run of the collections at Montagu House, and to be introduced into Sir Joseph Banks' library, was encouragement indeed (Reeve, 1863 : 114).

The influence of the men he met at the Museum was at a professional rather than at a personal level, since Gray at 18/19 years of age was already developing maturity through original work. Apart from lecturing on botany at the medical schools he was helping his father with the *Natural Arrangement*. At Banks' residence, 32 Soho Square, he consorted with distinguished academics, among them the French savants, H. M. D. de Blainville (1777–1850) and M. F. Dunal (1789–1856), and the most eminent of all, Baron Georges Cuvier (1769–1832); he also met the Swiss, A. P. de Candolle (1806–1893), and he made friends with the troublesome Richard A. Salisbury (1761–1829) and especially with John Richardson (1787–1865).

From 1822, after John George Children succeeded Leach, who had resigned through illness (Gunther, 1974 : 65), to 1824, when Gray was formally appointed in the Museum, he had developed under Children's supervision into a fully qualified assistant. Children's influence was of quite a different order from Leach's. Whatever his academic ability, which was considerable, his was the role of a man old enough to be Gray's father, which was what Gray most needed after his unsettling years as a medical student and his decision that medicine held no place for him. At any rate, the security of employment the Museum offered made marriage possible and from 1826 Gray's anxieties for the future came to an end.

The text of the fragments assembled in this paper, arranged as far as possible in chronological order, has been left unaltered except for some punctuation, spelling and paragraphing. Repeated versions of the same event have been omitted. But versions differing from those already printed elsewhere have been included, either because they complete the story or because they give it a different shade of meaning. Since the fragments do not offer a narrative in sequence, I have added notes to carry the reader through. The notes do not, however, repeat the fuller account of Gray's life published elsewhere (Gunther, 1975), but they include information not available at the time the published text of the *Autobiographical Journal* was prepared. Also included are various letters because they contain important additional information about the policy Gray was following in museum affairs.

There remains some problem about the dating of events in Gray's earlier years unless more information comes to light. From 1835, however, the House of Commons Select Committee of 1835–1836 (Parliamentary Papers, 1836) brought some system into the affairs of the Department of Natural History and led to the keeping of a series of letter books which bear the title of *Reports, Minutes etc. Zoological Department* (British Museum 1835–1853) which, assembled by Gray himself, give a detailed record of his Keepership. Therefore after about 1835 the dating of events referred to in his autobiographical manuscripts can generally be verified. These records also show the extent to which the then Keeper, J. G. Children, depended on Gray for the detailed running of the department (2). In addition to these records there are the Trustees Annual Reports of the Department of Natural History printed as part of the *Accounts Relating to Income and Expenditure, and Number of Persons Admitted* to the Museum (Parliamentary Papers, 1848–1868).

Miscellaneous autobiographical manuscripts

Note: the folio numbers in the left hand margin refer to *J. E. Gray, Miscellaneous Papers* (Gray, *c.* 1862–1874) in the British Museum (Natural History), General Library.

Samuel Gray IV (1694–1766) seedsman of Pall Mall

(f. 57) My great grandfather (3) had an estate at Oundle in Northamptonshire. In the Churchyard there you may read, or could fifty years ago, that the Grays were not

particular as to how they spelt their name. Thus one of [the] Grays fathers was spelt Wray, and a Wray had a father called Ouray, according to their tombstones. My father who had a great estimation for and studied Natural History in the books of the justly celebrated John Wray of Black Notley who spelt his name Johannes Rayius in his latin works which has been retranslated John Ray, thought that he was possibly a branch of the same family, but I have not attempted to unravel the question. (4)

Samuel Gray V (1735–1771) seedsman of Pall Mall

(f. 49) My grandfather, Samuel Gray, (3) was a seedsman at the Black Boy, Pall Mall, and had a garden in Tettlefields, Westminster, and was much in the habit of going there on Sunday afternoon. The house was pulled down when they built Carlton House. (5) His father and grandfather, also Samuels, lived there before him. They had much intercourse in the way of trade with Holland & they imported the making of flour of mustard and the cutting of glass from that country. Before they introduced it the mustard seed was crushed as it was required in a wooden bowl with a wooden [or] iron ball. They had a mill on the Ravensbourne (6) just at the back of Deptford, for the grinding of the mustard and the cutting of the glass. The mill is now known by the name Armoury Mill. The cutting of the glass was afterwards carried on as a separate business by their younger brother, who had a shop near Charing Cross. (7)

I recollect in my childhood my father inherited a massive glass candlestick, which was a specimen of the work done at the Mill. The flour of mustard was extensively used and I may cite as an instance of the length of time during which trifles may exist that when at Fishguard in Pembrokeshire (8) a few years ago I observed on the wall

(f. 50) behind the door of the general shop of that small village a Bill about 4 inches square pasted up, with "Sold Here Grays' flour of Mustard only to be had at the *Black Boy, Pall Mall*", and with the figure of the Nigger. Now that shop must have been closed for more than a century. The old woman in the shop said she knew nothing about it but that she recollected it was there when she was a child.

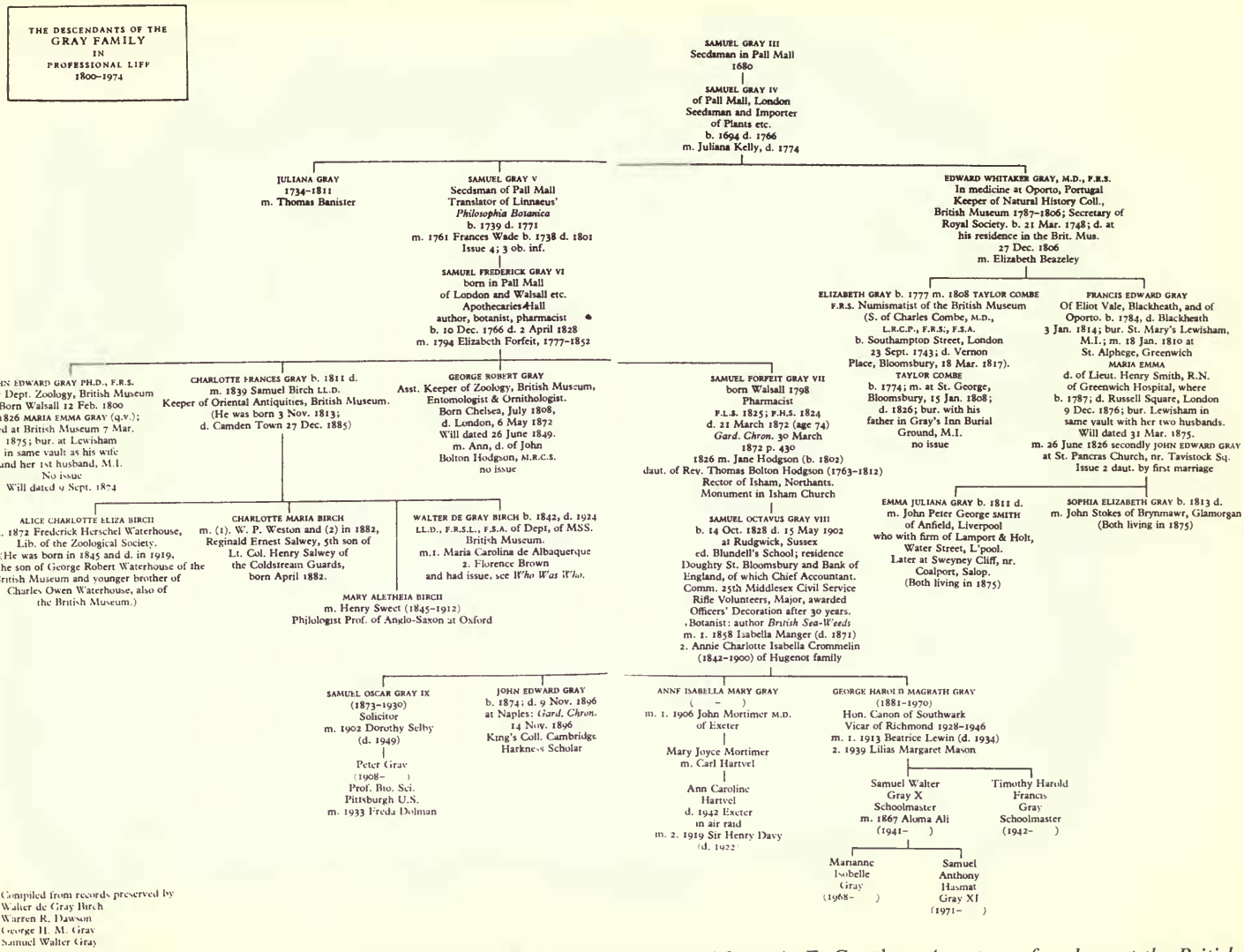
This woman showed a curious want of knowledge too well known to the poor in large towns. I had already purchased a boot lace and she could not change me a shilling so I emptied my purse for a smaller coin and turned out a farthing that I always keep at the fold to prevent the ring coming off. She took it up, and said "Is that what you call a farthing? I had been told you had such things in London but I never believed it", and she offered to take it for the penny lace. She was anxious to possess it and show it to her friends. She was more astonished when I told her that there were half farthings and I had several of them, but that the shop keepers were very adverse to using them, and that even smaller copper coins were made at the Mint and much used in Malta and other British possessions.

Edward Whitaker Gray, M.D. (1748–1806)

E. W. Gray, John Edward's great-uncle, was an important influence on his life, and this fragment summarizes most of what John knew about him, further discussed in Gunther (1976).

(f. 53) Edward Whitaker Gray M.D.

The eldest [younger] son of Samuel Gray (3) of Pall Mall was born the 21 of March 1748. He was educated in London, studying medicine under Dr. William Hunter (9). He practiced medicine in Oporto (10) and on his return to this country with a collection of Natural Productions of that country, he was appointed, chiefly by the interest of Dr. William Hunter, Assistant Librarian having charge of the Natural History Collections in the British Museum in 1778. On the 11 Feb 1779 he was elected Fellow of the Royal Society. In 1787 he was promoted to be Keeper of the Natural History Collections and Secretary to the British Museum and on the 30 of Nov. 1797 was elected the senior first secretary to the Royal Society. He retained these three offices until his death on the 27 of December 1806 (11); he was succeeded secretary of the



The descendants of the Gray family in professional life 1800–1974. Reproduced from A. E. Gunther, *A century of zoology at the British Museum, 1815–1914* (London: Dawson, 1975).

Royal Society by Sir Humphrey Davy. He published two [three] papers in the *Philosophical Transactions* entitled . . . (12) He married in Oporto, Miss Bearsley, and had four children (13); one of the daughters married Mr. Taylor Combe the first Keeper of the Antiquarian Department in the British Museum and for some years Secretary of the Royal Society from 1812 to 1824; the other died single.

Samuel Frederick Gray (1766–1828)

(f. 51) My grandfather had several children but they all died at a very early age and he left only a small life annuity to his wife and the rest of his property to his younger brother Dr. Edward Whitaker Gray, then in Portugal, but afterwards Keeper of the Natural curiosities in the British Museum and Secretary to the Royal Society.

(f. 54) A month or so after his [my grandfather's] death, his wife bore him a son [10 December 1766] who was christened Samuel Frederick Gray (14). As he lived, he was a very sickly child and he was dumb, but his mother, a woman of great energy devoted herself to him; she taught him to read and to ask for all that he required by means of letters cut out from bills and pasted on cards, so that he could read quite well when he could speak. Eventually he gathered strength and by the time he was ten [or twelve] years old he outgrew the defect in the organs of speech and gradually learned to speak but to the end of his life he had a very considerable impediment. His mother taught him Latin and Greek as well as English, devoting the whole of her time to his instruction and care, and he was of a very studious disposition. He was attached to old fashioned ways for I have heard it stated that he was almost the last man in London that wore his hair (that was very long and when untied would reach to his knees) in a large club and cocked hat.

(f. 51, 54) He was not regularly educated to any profession but that of medicine and anatomy, [and] selected various branches of Natural History and Chemistry, and what is now called Ethnology. He seems to have taken to editing as a means of livelihood, and for several years assisted Dr. Nairs [sic] (15) as sub-editor of the *British Critic*. But the misfortune of his birth seems to have followed him, for about this time he fell in love with a Miss Forfeit (16) and consulted his uncle [Edward Whitaker Gray] with the purpose of marrying, but the uncle, having come to the conclusion he should have no children . . . [was prepared to disown him]. (17)

On his marriage to Elizabeth Forfeit in 1794, he migrated to Walsall and then to Birmingham where he turned his knowledge of Chemistry to account, assisted by Dr. Priestley (18) and established an Assay office. Here a daughter and his two sons were born. In 1800 he returned to London, became private accountant to Charles Hatchett Esq. F.R.S. (19) and continued his literary occupations, contributing to various re-

(f. 56) views and periodicals as far as his declining health would allow. In 1818 he published the *Supplement to the Pharmacopeia* [Gray, S. F. 1818] which ran through several editions and is now published by Redwoods [1847].

He died on 12 April 1828 and is buried in New Chelsea Church Yard – bearing three sons and two daughters. Two of his sons, John Edward and George Robert (20) are employed in the British Museum and his younger daughter is married to Mr. S. Birch (21) of the same establishment.

John Edward Gray (1800–1875)

Born at Walsall, his family moved to Old Chelsea in 1800, remaining there until 1811 or 1812. Like his father the boy was extremely delicate, probably suffering from a childish form of tuberculosis, and remained so until about 10 years of age.

Chelsea 1800–1811 or 1812

(f. 6) Being a sickly child, and a friend having lent me the volumes of the *Encyclopaedia Britannica*, I read them and made models of the plates of the dials, other mathematical

inventions, and formed the idea of becoming a Mathematical Instrument maker or a Millwright.

Mr. Charles Hatchett (19), when calling on my father observed some card models, dials and an electrical machine that I had made out of an old bottle and offered that I should come and live in his house at Hammersmith and assist in his laboratory. My father after consideration thought I was too young and declined it for me. Mr. Hatchett soon afterwards took Mr. Brand. (22)

(f. 59) The first time I left home in 1811 I went to Mr. Wyatt (23), a bookseller in Pickett Street, Strand, with whom my father had an idea of entering into a partnership. I went on a Saturday and found only a room behind the shop furnished. Mr. Wyatt lived in the neighbourhood of London and I was left the only inhabitant of the large unfurnished house from Saturday night to Monday morning and every other night. I well recollect the quarter of an hour chimes of St. Clements Church my only companion, but my continuance there was not of long duration, as my father found that the partnership was not desirable.

Apothecary at Wapping, 1812–1816

In 1812 or 1813 the Grays moved to Wapping, a mile down the Thames from the Tower of London, and Frederick Samuel set up as Surgeon and Apothecary, remaining until about 1816. These three years transformed John Edward into a very capable young man and student.

(f. 6) My father . . . purchased the business of Mr. Pratt, the chemist and druggist in High Street, Wapping, (24) with the intention of settling my elder brother, but very shortly after we were established there, Mr. Symonds, the president of the Apothecaries Company offered my elder brother an appointment in that Institution which he accepted leaving my father who was in very ill health in a great difficulty, as he had just invested his money in the business, and I saw no other way out of it, than doing what I could to occupy the place that he had intended for my elder brother, giving up my predilection for a more scientific occupation though I had much repugnance to anatomy and the other duties necessary for the study of the medical profession. But I overcame the repugnance.

(f. 58) Of course in a nautical district like Wapping we had many surgical cases, and employed a young surgeon as an assistant and I often had to attend to the cases, especially on board the ships, and I had some opportunities of seeing difficult mechanical and other processes by the kindness of the persons with whom I became acquainted more especially the elder Rennie (25) who was then engaged at the London Dock.

(f. 110) As a boy on hearing the cry that the press-gang was coming – a cry that soon cleared the streets of Wapping where I was residing – I went to the shop door and seeing a man running who wanted shelter, I beckoned him into the shop, and told him how he could pass into another street through our back door. I had hardly told him so before the officer and his men arrived at the shop door, knocked me down, cut me across the hand with his sword, the scars of which I still bear, and as I failed to find the man in the house, they took me off, and kept me prisoner on board the tender off the Tower for some 24 hours.

This and the going aboard a vessel to dress a very severe scald that a man had on board a ship, when the river was filled with ice and one could only go aboard by passing from hummock to hummock on a hurdle made me a kind of hero in the estimation of the workmen in the neighbourhood.

Botanical studies

While at Wapping, as assistant in his father's shop, John Edward continued to study botany by week-end excursions south of the Thames into what was then country-side and villages. The peace, following the Battle of Waterloo, brought depression of trade to the ports on the Thames.

(f. 63) I was in the habit of taking long walks in the neighbourhood of London when the shop was closed on Saturday night returning to be ready on Monday morning, often sleeping part of the night on the lee side of a hedge or haystack to be ready to catch the insects at early dawn and I believe that the establishment of my health may be dated from this exercise. It was on one of these excursions that I became acquainted with Mr. J. F. Stephens (26).

(f. 61) On my father being obliged to retire from the business in High Street, Wapping, by the stagnation of business in that district by the peace and from ill health, I became an assistant in the laboratory of Mr. Willat, wholesale chemist and druggist, in Fore Street, Cripplegate. While there I copied after the warehouse was closed all the receipt books I could obtain the loan of from the different chemists and druggists; the greater part of these receipts were classified and printed by my father in the "*Supplement to the Pharmacopeias*" (Gray, S. F. 1818).

Sequence of events, 1816–1824

In 1816 the Grays moved from Wapping to Hatton Garden, in the City, and John's medical education started from there. He was invited to attend a school of Anatomy and Surgery run by John Colley Taunton (d. 1858) also in Hatton Garden; and to attend the lectures William Salisbury (d. 1823), botanist friend of the Grays in their Chelsea days, at the Maze Pond school near the Borough Hospitals of St Thomas and Guy's south of London Bridge. His attachment to St Bartholomew's Hospital under Dr John Abernethy (1764–1831) and to the City Dispensary were of a more formal character, and may have followed a year later.

The dating of events in Gray's life between the failure of the Wapping pharmacy and his appointment at Montagu House in 1824, remains uncertain, but the following is suggested:

1816 Gray family leave Wapping for Hatton Garden. John Edward invited to attend Taunton's School and William Salisbury's lectures at Maze Pond. Probably first met W. E. Leach and invited to Montagu House.

1817 Formal attachment at St Bartholomew's Hospital under Abernethy; takes over Salisbury's lectures at Maze Pond, and assists W. E. Leach at Montagu House.

1818 Routine medical education continues to 1823. Working with his father on *A Natural Arrangement* . . . (Gray, S. F. 1821) and given access to Sir Joseph Banks' library; assisting Leach at Montagu House; giving botanical lectures at Maze Pond, St Bartholomew's and Middlesex Hospitals.

1820 Leach's illness takes hold; Gray acting as assistant; *A Natural Arrangement* . . . completed.

1821 Gray visits Walsall on 21st birthday (7th February) and makes tour of Midlands, Manchester, Liverpool, etc. (Or perhaps between April and November 1823.) At Liverpool probably meets William Rathbone (1787–1868) educationalist and philanthropist, Mayor in 1737 (*D.N.B.*, **47** 1896 : 310); Joseph Brooks Yates (1780–1855) merchant and antiquary (*D.N.B.*, **63** 1900 : 298); and a member of the Holt family, unidentified, of later shipping interest (Gunther, 1974 : 65). George Samouelle appointed at Montagu House; *A Natural Arrangement* . . . published ; J. G. Children takes Leach's place and moves into Museum apartment on 9 December.

1822 Children formally appointed 9 March. Gray meets Children at Montagu House and is invited to help with the collections; he spent two or three half days a week doing so. Is rejected by Linnean Society on 16 April.

1823 2 April: receives Certificate of Attendance as Surgeon from C. J. Cusack, Royal College of Surgeons, and decides to give up medicine. From November 1823 to May 1824 Gray engaged in editing *Mechanics Weekly Journal*.

1824 Is appointed by Admiralty as naturalist on H.M.S. *Blossom*, and immediately resigns. 24 December, offered employment at Montagu House at 15/- each working day.

Medical education, 1816–1823

(f. 62) After leaving Mr. Willat I commenced medical studies as a pupil of Mr. Abernethy at St. Bartholomew's Hospital, of Dr. Merriman (27), of Middlesex Hospital and of the private schools of Mr. Taunton in Hatton Gardens and of Mr. Grangers' (28) of Maze Pond, giving lectures on Botany at the two latter and attending the practice of Dr. Unwins (29), Mr. Taunton and Mr. Kingdom (30) at the City Dispensary . . .

(f. 6) But I must say I always felt that medicine could do little and that the larger part of the patients required better food and solace, and [I] saw clearly that I should never make more than my livelihood by the practice of medicine.

(f. 7) While occupied in the study of medicine I was in the habit of going out from Saturday night till Monday morning into the country taking long walks and collecting plants and insects which I used to study and then give away to other collectors with whom I became acquainted. These had a great influence on my future life.

While a child living at Chelsea I knew William Salisbury (31), the partner of William Curtis, and author of the *Flora Londoniensis* (32). When a medical student he invited me to attend his lectures on botany at Grangers' School of Medicine in Maze Pond, and excursions to collect plants. He entered into a speculation of forming a botanic garden in Sloane Street, failed and was imprisoned for debt in the middle of one of

(f. 60–62) his courses. [In 1817, in result], I was elected by my fellow pupils, all much my senior (one of them being William Clift jr., son of Mr. Clift (33)) [of the College of Surgeons], to continue the lectures and conduct the excursions, which I did for succeeding years.

Sir Joseph Banks' library

(f. 7) In these I became acquainted with Mr. Stephens (26) and Dr. Leach (34). The latter introduced me to Sir Joseph Banks (35) who kindly gave me permission to attend his breakfasts and made whatever use I could of his Library and Collections. In this Library I became acquainted with R. A. Salisbury (36) and other English botanists and with Mr. de Candolle (37), Dunal (38) and other foreign botanists. With the advice of those named I prepared the paper on the Progress of Botany in the year 1820 that appears in *Thompson's Annals* (39), and wrote the systematic part of the *Natural Arrangement of British Plants* (40) which introduced the Natural System of Plants to English readers, and gave great offense to the majority of English scientific men as being an attempt to upset the Linnean System which was then universal and which it certainly has done, for now the Natural System is as generally accepted as the Linnean System formerly was.

(f. 57) My father regarded Jussieu's '*Genera Plantarum*' (41) as a natural extension caused by the progress of science of Wray's '*Methodus Plantarum*' and believed that the progress of Botany was retarded by the adoption in this country of the Linnean artificial system which, by the way, was not carried through, but its author acknowledged several natural groups as *Didynamia*, *Syngenesia* etc. Fortunately we have never had [in zoology] a system based on numbers or any other artificial grouping of zoology.

(f. 64) While studying at the Banksian Library, Mr. R. A. Salisbury (36) offered to settle on me his property at his death if I would undertake to print his botanical MSS. which I declined. The same offer was made to Lindley (42) who was a student in the Library at the same time. The property and MSS. were at length left to Mr. William Burchell (43), the African traveller, who has just died at an advanced age without publishing anything of Mr. Salisbury's. Miss Burchell, who was going to burn the MSS. etc., at my solicitation gave them to me, but unfortunately they were in a very deranged state.

(f. 65) I printed one portion of them that appeared to be in a nearly finished state and I gave the large number of dissections of genera of plants which were most beautifully drawn in pencil by Mr. Salisbury, after I had mounted them, in 4 thick guard books to the Botanical Department, British Museum. The *Lyriogame* and the genera *Pyrola* and *Ercine* in the Natural arrangement of plants are the only part of his MSS. that have been printed. (44)

Rejection by the Linnean Society, 1822

(f. 8) Shortly after the publication of the *Natural Arrangement*, Mr. Haworth (45), R. A. Salisbury (36), Mr. Vigors (46) and some of the active naturalists invited me to become a Fellow of the Linnean Society and they signed my certificate. However without any notice given to them, or me, on the night of the election, a large number of Fellows were assembled by special invitation and I was rejected nearly unanimously. Only one of the recommenders were present, as they considered my election a matter of course, and no candidate had been before rejected. If the slightest hint had been given me, I should immediately have withdrawn my name, as the subscription to the Society was more that I could well bear. The rejection only had the effect of making me more determined to devote myself to Science. Many members retained their opposition to the end of their lives. The President (47) found it necessary to alter his *Grammar of Botany* [1821] to the Natural System and it was gradually coming more and more into use. One President, the Bishop of Norwich, invited me to the Anniversary Dinner, and proposed my health (48). The Council referred a paper to me to report on and I was asked to subscribe to the bust of Sir James E. Smith. At length I was solicited to become a Fellow of the Society and was unanimously elected and have served on the Councils etc.

Spare time at Montagu House

The introduction Gray had been given by J. F. Stephens to Dr Leach allowed him to spend such spare time as he had from his medical studies, in Montagu House, and led him to hope that he might secure a niche there, but this was not immediately realized.

(f. 63) Dr. William E. Leach, who then had the care of the Zoological Collection at the British Museum, greeted with his usual enthusiasm a young man who had some knowledge of the works of Cuvier, Lamarck and Latreille (49), works which Dr. Leach was translating, and bringing for the first time before the English student, a work that he chiefly did at night, and eventually destroyed his health.

(f. 7) I gave as much of my leisure as was at my disposal . . . to assisting Dr. Leach in the naming and arranging of the Museum Collection. Dr. Leach, with his unceasing desire to introduce the improvement in zoology which the French had made and the translation of their works which appeared in the *Encyclopaedia Britannica* and the *Edinburgh Encyclopaedia* (50), overworked his brain and was forced to take rest and eventually retire. I offered myself to the Trustees to keep the Collection in order, in the hopes that with rest he might recover. But my predilections for the Natural System had raised many enemies against me, and they used their influence to prevent my obtaining it, and recommended the appointment of a person who proved to be inefficient.

(f. 70) I was a candidate some years previously, to be employed in the Museum to look after the Natural History Collection during Dr. Leach's (34) illness. Mr. König (51) promised me his support and recommendation and desired me to keep my candidature private. I did not succeed. Mr. König in his evidence before the Committee (52) states that he recommended that Mr. Samuel [Samouelle] (53) be employed. It appears that Mr. Alexander MacLeay (54) invited Mr. König to breakfast to meet Mr. Samuel

(f. 71) and the affair was then arranged. Mr. Samuel was a porter at Messrs Longmans, fond of collecting insects but quite ignorant of the scientific part of the subject . . . He compiled an introduction to Entomology chiefly extracted from Dr. Leach's (50) translations of Latrielle's *Considerations* in the *Edinburgh Encyclopaedia* (55). He knew so little of the subject that he left out the sections into which the families were divided, so that the genera were quite incomprehensible and the book useless to the student.

. . . he once said to me "that you should not work so hard as your work will come to an end before you did to yourself". He took to drinking and was discharged by the trustees. Mr. König was very charitable and gave him a sovereign when he came to

beg of him; he went direct to the public house and drank away his money and suddenly died on his way home.

(f. 7) While working with Leach (34) I had paid particular attention to Shells and afterwards [following the Samouelle incident] Mr. James Sowerby (56) the elder proposed that I should continue the study, and that he and I should publish work on the subject together, he drawing the plates, and I writing the text, [but Mr. Sowerby was taken ill and died the following year.]

(f. 66) Being disappointed in 1821 in obtaining the temporary care of the Zoological Collection of the British Museum during the ill health of Dr. Leach (34), I turned my knowledge of mechanics and chemistry to account, became one of the Editors of the *Mechanics Weekly Journal* (57), and made a two months excursion through the midland and northern and western district of England, to examine the manufactures and factories, and to obtain a personal knowledge of the wants and feelings of the working people of those districts, and during this visit I made the acquaintance of several of the leading commercial notabilities especially the Rathbones, the Yates and Holt, who remained my friends to the end of their lives. [In part 1823? See dating above.]

(f. 19) It was my day dream when a lad that I should like to be like my great uncle, the Keeper of the Natural History department in the British Museum, most improbable considering the circumstances of my father and myself caused by his continued ill-health. But somehow from a child I had found many celebrated men who were kind to

(f. 67) me . . . And whereby I have been enabled under the fostering kindness of Dr. Leach (34) and Mr. Children (58) to spend a great part of my leisure in arranging the Collection, to obtain regular employment which had been the chief object of my ambition for several years.

Keepership of J. G. Children, 1822

(f. 10) Mr. Children, who was appointed to succeed Dr. Leach, and having occasion in the course of my studies of Shells to visit the Museum Collection [in 1822] to examine some genera that I had not seen elsewhere, Mr. Children observed that I seemed to have a good knowledge of Shells and asked me to look over the Collection that was being arranged and eventually asked me if I would be willing to give him what assistance I could. On his invitation, I attended constantly at the Museum, affording him gratuitous assistance, he little thinking of the difficulties that I had to support myself.

In spite of Gray's poverty at the time, he appears to have had no wish to work elsewhere than in the Museum.

(f. 10) It was decided that Captain Beechey's Expedition should be accompanied by a naturalist (59). On Mr. Children and Captain Sabine (60) speaking to me, if I was willing to undertake the office, they recommended me to the Admiralty for the appointment which was duly made on most liberal terms. I soon found from Captain Beechey's manner that I should not be able to do much and that what I did was to be done in the Captain's Cabin and written in his Journal. For as he said "he was not going to have his expedition named the Gray Expedition as Captain Bandini's Expedition was called the Expedition of Peron and Le Sueur" (61), whereon I resigned my appointment and on going to tell Mr. Children what I had done he said he was put under great difficulties by my absence, and asked me if I would accept a situation in the Museum to assist him. I said it was the hopes of getting such a situation on my return that had made me accept the situation on the Expedition and I should be glad to assist him, as I had made up my mind to devote myself to the study of Zoology. (f. 19) He ex-

(f. 19) pressed great astonishment when I accidentally mentioned the very great straits that I was under during the time that I had worked at the Museum without any pay.

(f. 10) On consulting with the Principal Librarian (62) it was agreed between him and Mr.

John Edward Gray, 1830, by Henry Phillips. Reproduced by courtesy of the Director, Royal Botanic Gardens, Kew.

Children, to recommend me, and I was appointed by the Trustees to be engaged for six months at 15 shillings a day on the days actually employed in making out a Cata-
(f. 20) logue of the Reptiles. I was appointed in 1824 for six months, but as I told the Trustees several years ago [in the 1860s] the term had not come to an end yet.

(f. 20) Mr. Children kindly consulted me and most frequently adopted the suggestions I made to him. I set out with the desire: 1st to make the Zoological Collection as perfect as possible, 2nd to allow the public and the student to have the utmost freedom in consulting and studying the collection consistent with its proper preservation.

Select Committee, 1836

(f. 10) When the Parliamentary Enquiry (63) [Parliamentary Papers, 1836] into the British Museum took place, I assisted Mr. Children in compiling statistical accounts of the state of the Collection, and it was upon his recommendation, though only temporarily appointed and receiving daily pay, I was called as a witness as to the state of the Collection, and to answer the objections that had been given in evidence against its extent, condition and management. Mr. Hawes (64) repeatedly asked me if I had no personal grievance, for he had observed that a personal grievance seemed uppermost in the head of all the officers during their examination. I told him I had none, and that if I had, I did not conceive a Parliamentary Committee the right place to ventilate it, and that I understood the Committee was to examine the present state, management of the Museum, and to recommend how it could be rendered more efficient. I freely gave my opinions on these questions and the Committee in their Report generally adopted my suggestions (65).

(f. 71) Mr. Samouel (66) and his friend Mr. Millard, an assistant discharged for his idleness, supplied to Mr. Hawes a number of stories against the different persons employed in the Museum. Mr. Hawes said, I have a great deal of information supplied to me but I suppose I am unfortunate in my choice for I cannot use it all, and when I asked a question from them I always meet with a distinct denial supported by good evidence.

(f. 69) . . . Mr. Children before the Parliamentary Committee on the Museum observed that he considered "the best thing that he had ever done for the Museum was the recommendation of Mr. Gray". When the evidence was published I had a note from Sir R. Inglis (67) observing, that the Editor of the Report [Sir H. Ellis] had rather modified Mr. Children's answer in the printed evidence, into "one" of the best things.

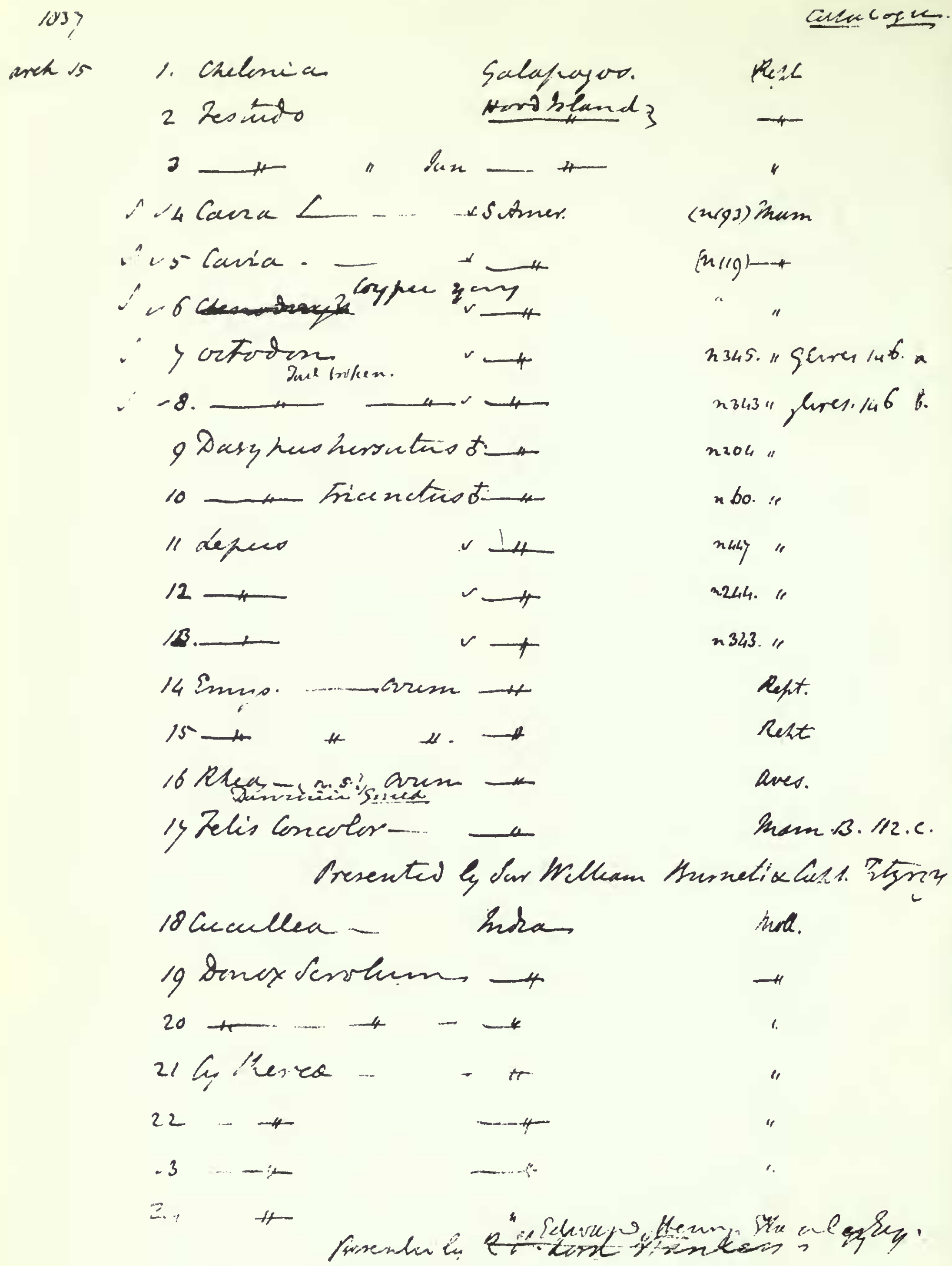
(f. 10) A few [four] years after the Committee, Mr. Children resigned the Keepership of the Zoological Dept. which had been separated from the Mineralogical and Botanical, and I was appointed to succeed him (68).

I have formed during the time that I have been employed by the Trustees, chiefly at a small annual expenditure, the largest and most complete and best arranged and named Zoological Collection in the world. I think I am justified in saying so when persons who study particular parts of Zoology come to study it, they always find the Collection of their part the largest and best arranged that they have consulted, and if each part is so, the whole must be. I have during that time prepared or edited the publication of 200 Catalogues of different parts of the Collection, and printed more than 1000 memoirs or essays on the specimens in the Collection several of them of considerable extent. [Gray, 1875]

Management of the Zoological collections

(f. 10) The general management of the business of the Department, the collecting and seeing after the preservation of the specimens has occupied the greater part of my time and constant supervision is required to keep the various persons employed and parts of the Collection in order.

(f. 75) Being convinced that the superintendence, preservation and extension of a collection, whether of Natural History, Books, Manuscripts, or Antiquities, was as much a



1837 Catalogue.

arch 15

1. Chelonia — Galapagos. — Rept.
2 Testudo — Hood Island — ″
3 — ″ — ″ Jan — ″ — ″
4 Cavia — — — & S Amer. — (n93) Mam
5 Cavia — — ″ — ″ — (n119) — ″
6 ~~Chenodaryx~~ Copper zany — ″ — ″ — ″
7 Octodon — ″ — ″ — n345. ″ Glires 146. a
8. — ″ — ″ — ″ — n343 ″ Glires. 146 b.
9 Dasypus hirsutus ♂ — ″ — n204 ″
10 — ″ — tricinctus ♂ — ″ — n60. ″
11 Lepus — ″ — ″ — n447 ″
12 — ″ — ″ — ″ — n244. ″
13. — ″ — ″ — ″ — n343. ″
14 Emys — Orum — ″ — Rept.
15 — ″ — ″ — ″ — ″ — Rept
16 Rhea — n.s.? Orum — ″ — Aves.
17 Felis concolor — ″ — Mam B. 112. c.

Presented by Sir William Burnett & Capt. Fitzroy

18 Cucullea — India — Moll.
19 Donax Scrobium — ″ — ″
20 — ″ — ″ — ″ — ″
21 Cytherea — — ″ — ″
22 — ″ — ″ — ″
23 — ″ — ″ — ″
24 ″

Presented by Sir Edward Henry Ker al Esq.

Accessions Book of the Zoological Branch of the British Museum, first folio in the hand of J. E. Gray, 15 March 1837.

business as any other commercial occupation, and as such required a regular, special education, a person who is required to successfully carry on a business with a special knowledge of the subject added, I therefore strongly recommended that a number of young men should be appointed to learn the business and that those that showed an aptitude for their work should be promoted, instead of the usual easy system of promotion according to seniority which drives away all the younger men who feel that they have higher qualifications and leave only the second rate men who did just
(f. 76) enough to keep their posts. Thus Assistants have left the Museum that are now leaders at the Bar, Colonial Judges and other holders of important offices, who saw that there was no chance for their talent under the usual system of seniority.

(f. 67) I always felt great interest in what I felt ought to be a School of Natural Science of the nation.

(f. 72) The chief cause in my success in founding the very large Zoological Collection has been the catholicism of my taste, having had no predilection for any series of animals but having desired to collect all that came in my way to store them away in their systematic places, with the history of each specimen attached to it so that they might be available for the student who might desire to study them, and the student has usually been astonished at the riches of the part of the collection which he has desired to study, and that he may use them in every way that is most desirable as if they were his own on the single condition that they should not be rendered less useful to any student that might come after him.

(f. 10) I think it is a great proof of the successful manner in which I have collected and arranged the different parts of the Collection that Walker (69), Smith (70) and other entomologists have published such extensive Catalogues of Insects, and Dr. Günther (71) Catalogues of Fishes, Snakes and Batrachians which he found here ready collected and roughly arranged, and only awaiting his descriptions.

Duplicates and exchange of specimens

As Gray's uncle, Edward Whitaker Gray, had found in the previous century, and as every keeper has found since, the disposal of duplicate specimens is more easily planned for than effected. The problem was that of accepting whole collections when only half the specimens were required. John Edward got round the problem through his interest in building up collections in the provincial towns; he would see that unwanted specimens did not formally come into the Museum at all, but went elsewhere. His successor, Albert Günther, also found that the problem of getting rid of duplicates gave his staff so much work that they passed it back to himself.

(f. 20) And I was soon convinced that the collection of duplicates was a great evil as they required as much care as the collection themselves and that it was best to purchase or select from those presented only specimens which were actually required for the collection, more especially as the exchange of specimens was very troublesome and led to much inconvenience, and was in fact returning to the habits of the ruder ages before the persons had found that it was better to buy and sell for money. I made it a rule to recommend that the specimens we did not require should be given by their proprietors to some other institutions or be sold so that those who required them could purchase them. I am sorry to say that my recommendations of specimens being given away have not always been so successful as I could wish; as the following details will show; but I do not regret having followed the plan, and certainly the selection of specimens we wanted has enabled me with the kind assistance of the Trustees to collect together the largest and most complete and easily consulted collection of Zoological specimens and osteological specimens in the World.

(f. 21) Several years ago, accidentally calling on an agent, he informed me he had just purchased from a person coming from Hudson's Bay a series of skins of a small Buffalo and that he intended to have them made into rugs or robes. I at once saw that they were the skins of the Mus[k] ox. Knowing that we had two specimens in the

Museum which were considered to be the only two known in Europe I purchased on my own account the whole series and presented a specimen to Paris, Leyden, Frankfurt, Stuttgart and one or two other towns. I know they were received but I never received any acknowledgement of their arrival except from Stuttgart. The King of Wurtemburg kindly sent to the ambassador a decoration of an order, but the ambassador at once informed him that I should not be allowed to wear it as a civilian and returned it without my knowledge on which he sent me a gold medal as one of "the Worthy". (72)

The Museum has very recently received (73) from Germany the offer of a skin of this animal asking me what price the Museum would give for it and letting me know that a very large price was expected. Now these animals are found on the coast of Greenland as well as in the barren parts of the arctic regions, they will probably become more usual in Museums. The German specimen was probably brought by their late scientific expedition.

(f. 22) Dr. Ruppell on the return from Abyssinia (74) where he travelled for the purpose of collecting, brought home with him a considerable number of Mammalia and birds for the Senckenberg Society of Frankfurt and for the purpose of enriching it by the exchange of his duplicate specimens which he had obtained. He sent a very perfect series of the Animals and birds to the British Museum. I told him that we had no specimens that we could offer in exchange for them but that if he would state a price or appoint a person to state a price I made no doubt that we should agree and that as he disliked to receive money for his specimens if he went about among the dealers in London or Paris and selected what he desired and sent the bills to me I would pay them to the amount which the collection of Abyssinian animals amounted to. After some objection he agreed to this proposal and made extensive purchases.

Being some years afterwards in Frankfurt I asked Dr. Ruppell how he had succeeded in the exchanges of his Abyssinian specimens; he said very badly and that the only place in which he had received a fair return of specimens was from the British Museum. Yet somehow the Continental and especially American Naturalists seem to be prejudiced in favour of the barbarous system of exchange in which in general each person seems to think that he has been over-reached.

(f. 23) The widow of Admiral Sir John Harvey (75) made an extensive collection of shells, sea-eggs and other animals which she took with her to Edinburgh. When she was removing from that City she consulted me what she had best do with her collection. As the Universities were talking of establishing a school of Natural History I recommended that it should be sent to Oxford. She communicated with the Authorities and they sent a man to pack it up and transmit it to Oxford. Nothing further was heard of the collection. Some years after meeting Mr. John Phillips at the British Association meeting at Cheltenham (76) I enquired of him what had become of the collection and what had been done with it. He declared that he knew of the existence of no such collection in the University and seemed to doubt its ever having been sent there. His sister was with him and observed, "Why John, it is one of the boxes in the collection that you found in the basement of the Taylorian Institution and did not know from whence it came." When I went to Oxford to see the new [University] Museum I identified many of the shells that came out of that box as being part of Lady Harvey's collection, but I suppose the birds and other things were destroyed by damp [and] insects.

Osteology

(f. 24) In 1846 Mr. B. H. Hodgson (77) who during his residence in Nepal collected a very large series of Mammalia and Birds and their skeletons and gave them to the Museum on condition that it should print a catalogue of them and distribute the series of duplicates of them according to their completeness to various British and Continental collectors. [As] The Catalogue observes, a series was selected from them for the

British Museum collection and the duplicates were distributed in series and sent to various British and Continental collections in the following order:—

1. Museum of the East India Company
2. Museum of the University of Leyden
3. Museum of the Garden of Plants, Paris
4. Museum of the University of Berlin
5. Museum of the Senckenbergen Society at Frankfurt
6. Museum of the University of Edinburgh
7. Museum of Trinity College, Dublin
8. Museum of the Natural History Society, Newcastle-on-Tyne
(f. 25) 9. Museum of the Canterbury Natural History Society
10. Museum of the Manchester Natural History Society
11. Museum of the Earl of Derby, Knowsley
12. Museum of Hugh Strickland Esq. Oxford (78)
13. Museum of the Zoological Society.

The duplicates of the osteological specimens were sent to:–

1. Museum of the [Royal] College of Surgeons
2. Museum of the Royal Naval Hospital, Haslar.

Unfortunately many of the specimens [of the skins] had been in the country several years and from the want of being opened and examined they were not in very good condition. Perhaps this may explain why I have not observed a single specimen of any of the birds sent, exhibited in any of the Continental Museums which I have visited since that time.

(f. 26) The collection of osteological specimens was very important to the Museum as it was the first large collection of that kind that the Trustees had ever accepted and it may be considered the basis of the largest osteological collection in Europe that the Museum now contains (79). The collection sent to the College of Surgeons was found by Mr. Flower (80) many years afterwards in the box in which they were sent, in the basement of the College with all the labels rotted, without any indications from whence they came and Mr. Flower was able to identify them by comparison with the specimens in the Museum.

(f. 27) On Mr. Burchell's return (81) in the early part of this century [1815] he showed his collection of skins and mammals to Dr. Leach (34) and presented them to the British Museum. They were very interesting as being the first South African skins that we had in the country; but they were taken off the animals and the smaller ones instead of being rolled up and packed were lying about the waggon while the larger ones, as the giraffe, were stretched out on the outside of the cover of the waggon. The consequence was that the skin of the legs had very much shrunk and the hair on many parts of the body were destroyed so as to quite unfit it for stuffing. The skins of the male and female giraffe and of the zebras were stuffed at a very great expense and the Museum were quite as much abused for showing such bad specimens as it was for not having more stuffed by those who did not know their state.

(f. 28) Fortunately Major Hamilton Smith (82) examined and drew all the specimens when they first arrived; he had the habit of drawing animals as if studied from life whether he took it from a few fragments as the head, tail and limbs, from an important skin in a bad state or from a bad wood-cut or figure such as those in Piso & Margrave, [sic], (83) or from a worse sketch, so that his figures must not be taken as representing the state of the specimens when he saw them. I speak this from personal knowledge as I was often with him when he made the figures from Burchell's specimens and from other sources. Mr. Burchell was a peculiar person; he gave out that he was going abroad, but took a small lodging at Blackheath and there composed the first volume of the early part of his travels which only are published. (84)

(f. 29) He kept the birds and other specimens he collected, had some of the birds stuffed and had all the specimens placed in boxes and carefully papered up. They remained in this state during his journeyings in Brazil (85). He was a very careful man and all his collections of animals, insects and plants were placed in order, in a large room, at the back of his house at Fulham. But being fond of drawing and music, especially the organ, he did very little in Natural History during the latter part of his life.

When Dr. Ruppell (74) came to England after the Abyssinian Expedition (86) and was very anxious to see some of Mr. Burchell's birds, I took him to see my kind friend and after considerable hesitation he agreed to show him some of his African type
(f. 30) specimens: but there was a difficulty about getting the boxes open. We went down a second time in a few days, provided with a hammer and chisel to prevent a recurrence of the same difficulty. Mr. Burchell laughed at our persistence and agreed to our opening the box containing the Vultures which was most carefully packed, but when opened it contained nothing but the naked skull, arm and leg bones, all the rest had been eaten up, and this was unfortunately the state of all the boxes of African birds which we examined much to our grief and disgust: for the remains showed that Burchell had collected in the early part of the century many species which were described for the first time by Dr. Ruppell half a century later. When Mr. Burchell died, the insects, skulls of animals and the zoological specimens collected and left by Mr. Burchell were given by his sister to the Museum at Oxford, and the dried plants etc. to Kew.

Provincial museums

Since accepting gifts of whole collections meant loading the Museum with duplicates it did not want, Gray went to great pains to deflect them elsewhere. It was a policy that ran counter to that accepted at Montagu House where duplicates crowded the basement for the enjoyment of moths and ptini.

(f. 110) I have endeavoured to assist in the formation of Museums not only in the provinces and in Australia but in the Universities. (f. 73) It was on my recommendation that the late Lord Derby gave his collection to the town of Liverpool . . . (87) I also gave great assistance in procuring and sending Massena's Collection of Birds to Philadelphia (88), and especially in greatly extending the National Museum of Melbourne in Victoria (89) and the herbarium of Trinity College, Dublin (90), with a very large collection of plants of all countries formed in Belgium.

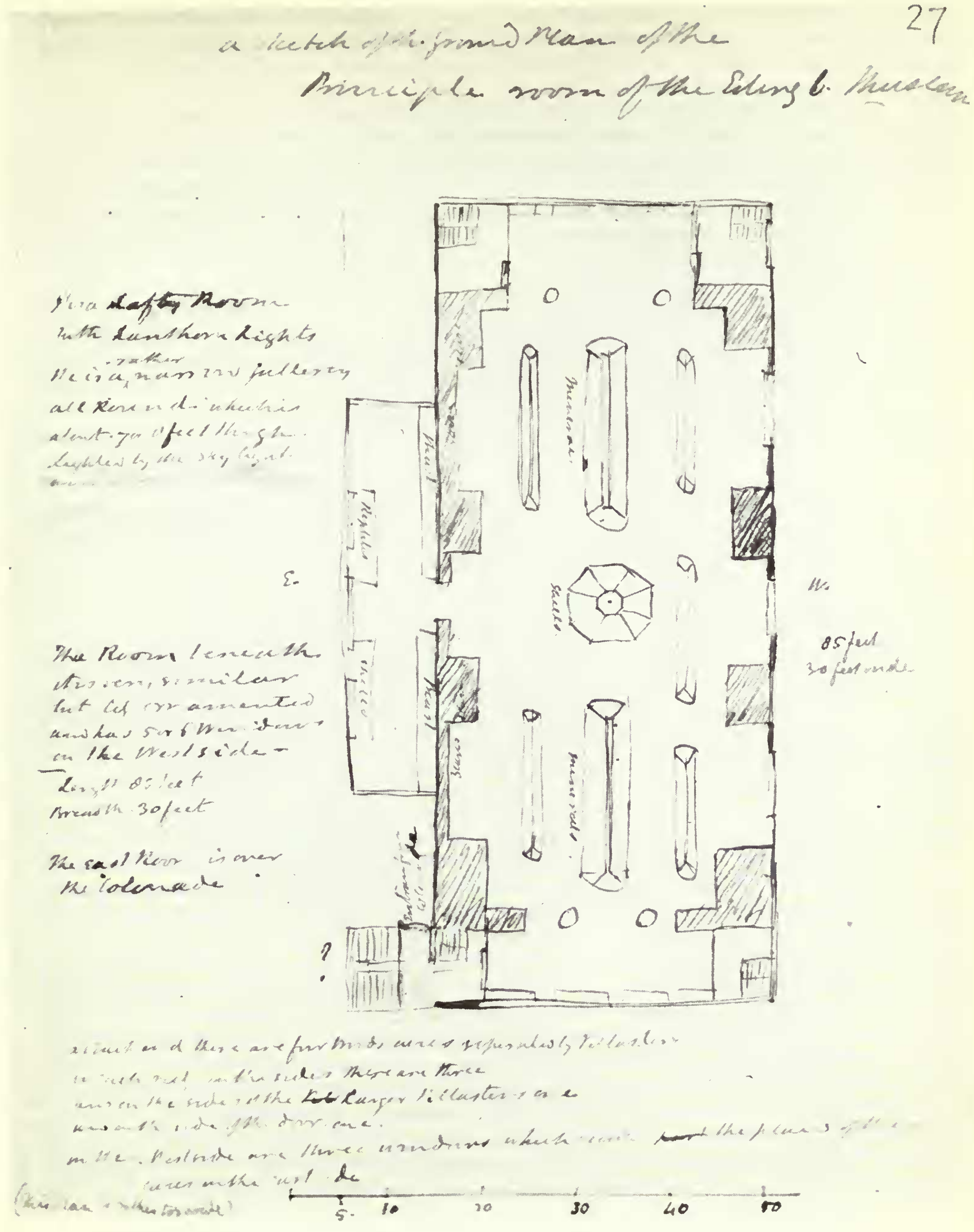
(f. 110) At my recommendation Mrs. McCulloch [sic] sent her husband's very extensive Collection (which paid legacy duty as being worth a thousand pounds), of minerals and geological specimens to the University of Oxford; although we knew that the Collection arrived safe neither Mrs. McCulloch or I ever received thanks for the present. And I believe that the Collection is put away in some unknown place, for one cannot conceive that a Collection consisting of a number of very heavy cabinets of between 4 and 5 feet by 3, have vanished into thin air (91).

More lately Mr. Robert MacAndrew, after a consultation with me, left his large Collection of Shells, and Natural History books to one of the Universities, [Cambridge] having in my own mind no predeliction for one over the other at his death, which has just occurred (92).

I need not add that a self-taught man as I am I ever received the slightest recognition of my exertions in the cause of Science from either of the Universities.

Botanical Society of London, 1836

After the publication of *A Natural Arrangement* in 1821 and his rejection as Fellow by the Linnean Society in February 1822, Gray turned, under Leach's influence, from botany to zoology, although he probably continued botanical lecturing for his living. But he never lost his interest in botany and maintained contact with it through the Botanical Society of London (Gunther, 1975 : 74)



Sketches by Gray (c. 1830s) of the lay-out of the Edinburgh Museum made in preparation for the final move into the New Museum in c. 1840.

from 1836, through his great friend in the Museum, John J. Bennett (1801–1876), Keeper of Botany from 1858, and through his wife's interest in algae in which she was to become expert. His editing of R. A. Salisbury's *Genera of Plants* in 1866 has been mentioned above (44).

(f. 9) Some years afterwards [in 1836] when I had chiefly turned my attention to Zoology, a number of British Botanists who were chiefly young men and all unknown to me personally, formed themselves into a Society under the name of the Botanical Society of London (93), and invited me to become their President, as they looked upon me as the introducer of the Natural System of Plants to the British Botanist. The object of the Society was to read papers, to form a Collection and to receive from its members Collections of British Plants and to distribute them among the members to complete their herbaria. Mr. Watson, who was a Vice-President of the Society, undertook to examine all the specimens and see that they were properly named before they were distributed, and compiled the greater part of his *Cybele* from the Collection thus examined and a *Catalogue of British Plants* for the use of the members which has gone through many editions. Mr. Symes [sic], the editor of the last edition of the *English Botany* was the Curator of the Society's Collection.

After several years, [when] the Society seemed to have done its work of distributing well named specimens, [the] opportunity was taken of the death of several of the more active members and the removal from London of others to dissolve it [in 1857]. Portraits of the President, Vice-President and Secretary having been painted for the Society by subscription, on its dissolution it presented my portrait painted by Mrs. Carpenter [1793–1872] to the Royal Society.

Museum policy in the 1850s

In 1859, Gray appears to have discussed with some unnamed official his work of building up natural history collections in other institutions, from the duplicates that came his way. Whether or not this was a member of the staff of the Museum is not clear, but it may well have been with Professor Owen who had lately entered the Museum as Superintendent of the Natural History Collections. Gray's ideas were expressed in a letter which clearly summarizes his experience and opinions.

(f. 132) My dear Sir,

As you appeared interested in the observation I made with respect to the idea which I have long entertained of making use of the duplicates in the Museum of use to the different scientific and especially the educational institutions of the country I herewith send you an account of what I have hitherto done and the manner in which I think it may be carried into execution.

Finding with every care, it was impossible to prevent the Museum from collecting some duplicates and believing that with very little additional expense we might easily collect many specimens of the more common kind, in 1837 I induced Mr. Children, the then Keeper of the Zoological Department, to report to the Trustees that it would be desirable [and] to the Museum's great advantage [for] facilitating the study of Natural History if the Trustees would send series of duplicates properly selected and named, [based on] the outline of the arrangement of the Animal Kingdom, to the different local institutions. The Trustees entered into the idea but felt that it could not be carried into execution without the consent of the Treasury and they referred the question to their consideration. They replied as follows on ? July 1859 [reply not available].

(f. 133) [On] June 10 1859, a letter dated 8 June was read from the Treasury in answer to the Secretary's letter of 25th May.

The letter stated that "their Lordships respected the liberal feeling which had induced the Trustees to propose that the duplicate specimens of Natural History in the Museum should be distributed among the institutions; they were much impressed with the

opinion that practically such a course would give rise to jealousies, discontent and complaints which on the whole would counterbalance any public advantage contemplated by the proposed course and therefore suggested the propriety of selling the duplicate specimens however small their value by auction in such a way as the Trustees might think more expedient".

This was probably a wise determination at that time as far as the government was concerned, but being convinced of the desirability of distributing the specimens sent, I have tried to carry out the plan privately as far as I have been able in my power making it a rule when a collection has been offered to the Museum to select the specimens only when we absolutely required and recommending the proprietor to send the remainder of its numerous series of the specimens to other institutions.

In 1845 when Mr. Hodgson (77) sent his very large collection of the skins and bones of Indian Mammalia and Birds to the British Museum and he was recommended to make a distribution of the duplicates – among the larger British and Foreign Museums,
(f. 134) and with the consent of the Trustees the Museum undertook the distribution of them, and the same course was followed by the Museum with respect to the Fossils from India collected by Colonel Cautley and Mr. Falconer (94).

In the same manner when Lady Harvey (75) consulted me respecting the disposal of her Museum [before 1856] as it contained very few specimens required by the British Museum, I recommended that it should be sent entirely to the University of Oxford, and when similarly consulted by the Earl of Derby (87) I observed that we already had so many of the specimens it contained that it had better be presented entire to some Institution; it eventually becoming the Museum of the Town of Liverpool.

And more lately when the Juligi Society determined to part with their Museum, I pressed on the Secretary the diversion of the specimens which remained, after the specimens of more scientific interest had been selected, into a series to illustrate the classification of the animal kingdom, as to offer them to public institutions at a moderate price and where it is the intention of that gentleman to carry the plan into execution.

But these means, carry out very imperfectly the object I had in view when I recommended the plan. The Societies and Schools received a number of unnamed specimens which may often be duplicates of one another of the specimens they already possess. Instead of having sent to them a series of named specimens selected so as to illustrate the Classes, Orders and Genera of the Animal Kingdom according to the size of the collection sections of which would be rendered more complete by periodical additions according to the number of specimens at the disposal of the Institution.

(f. 135) At various times I have hoped to induce some Naturalist, or a Society of them, to form a Society for the purpose of distributing names of specimens of animals in the same manner as the *Botanical Society of London* have distributed named specimens of British Plants to their subscribers. The Society received the duplicates from the different members and sent them in return the species which they require to complete the collections. The Society in fact undertakes the machinery of, and verifying the nomenclature of the specimens, and distributing them to where they may be required as for example the Southern plants to the Northern subscribers and *vice versa*.

To give some idea of the facilities which the Museum possesses I may state that after using every care not to take more specimens of a kind that will illustrate the changes of growth, local varieties and the distribution of each species, (and such as are required to replace the specimens which may be deteriorated by exposure to light and the smoke and dust of London), we have added nearly half a million of specimens to the Collections within the last 19 years [thus written in 1859] and I believe that this number might have been very considerably increased with a very moderate additional outlay – so that the chief expense incurred in making the distribution would be the
(f. 136) employment of a few additional assistants to make the selection and distribution of the specimens.

I may observe that a small, well-selected collection, is far more useful for study than a large and more complete one, as it often shows the well marked distinction between the Genera and large group which are graduated away in a larger series, and in making selections of the kind I think that care should be taken not to send the same series of specimens to all the institutions, so that the student may not be all cast in one mould, an evil much to be feared in governmental education.

[Letter on Museums Policy ends here.]

A Superintendent of the Natural History Collections, 1856

In 1856, the Trustees of the British Museum had resolved to appoint a Superintendent of the Natural History Collections, both to increase the status of science within the institution, and to effect the coordination of the four departments: Botany, Mineralogy, Zoology and Geology.

The following draft appears to have been written by Gray as a preamble to his application for the office, and so has been kept separate from the autobiographical passages that precede and follow it.

(f. 130) The Trustees of the British Museum having determined to create a New Office under the style of Superintendent of the Natural History Department, Dr. Gray begs herewith to lay before the Principal Trustees his application for the office, accompanied by a short statement of the grounds of his application.

. . . . . .

When Dr. Gray was first appointed Assistant in 1824 the whole Zoological Collection was restricted to two rooms not 50 feet square [50 ft × 50 ft (15 m × 15 m)]. That inevitably increased and was steadily increasing, both in extent in the facilities which it offered to the student, in 1834, so that when the parliamentary enquiry was pending in 1835/36, Dr. Gray was able to meet all the complaints made against it and its management before that committee. Since that period, as more room has been devoted to its development, it has been repeatedly increased until it has been almost unanimously allowed by all foreign Naturalists who come to consult it, to be the most complete in Number of Species, the best arranged and named in all its branches, the most easy of access and offering the greatest facilities for study of any Zoological Collection in the World.

Dr. Gray was appointed assistant in the Natural History Department on the 24th December 1824; Assistant of the Zoological Branch of the Department in 1837, and Keeper of the Zoological Department in 1840, and became Senior Keeper of the Natural History Department on the death of Mr. Koenig in 1851. Though Dr. Gray was first appointed and paid by the Trustees in 1824 he had assisted Dr. Leach (34) to arrange the Collection between 1817 and 1818 and Mr. Children from 1823 to 1824 attending regularly three days per week without any remuneration simply for the desire to render the Collections useful to the public and to increase his knowledge of the subject.

Dr. Gray, when first appointed, was employed under Mr. Koenig (51) in all parts of the Collection, and besides his knowledge of Zoology, to improve himself in Mineralogy, he formed a considerable private collection of Minerals (now with his daughter at Liverpool), arranged according to the most advanced state of the science; and from his knowledge of Botany he has been President of the Botanical Society of London from its establishment in 1836. In this period Dr. Gray wished simply to prove that he took an interest in all the branches of the department and was not likely to neglect or show partiality for any particular department.

Dr. Gray has made it a rule to spend the greater part of his annual vacations in visiting the different continental museums to make himself acquainted with the manner in which they are conducted and arranged, how named and catalogued, and to meet the different dealers residing on the Continent (95). The result has been that he has been enabled [to make] such a business connection with them that they uniformly

make the first offers of all the specimens that come with their properties to the British Museum as the best customer who gives them the most rapid reply to their application.

Greater distribution of scientific works

(f. 136) Believing that books of a higher class are as much wanted in the Education Institute as specimens, in 1847 [1846] I was induced to write to Lord John Russell and sent a copy of it to Mr. [Thomas] Wise [MP] who had been my colleague on the Council of the Central Society of Education, the following letter (96):

British Museum
10 July 1846

My Lord

I beg to lay before you the following scheme for encouraging Literature and the Fine Arts and spreading a taste for them amongst the masses of the people.

1st. The Government should subscribe for a certain number (50 or 60) copies of the expensive Illustrated Works published in this country, for this purpose a large annual sum would not be required. Great care should be taken that only works of the highest character are thus encouraged.

2nd. That the copies so taken should be lent to different Mechanics Institutions, Schools of Design or other poorer associations of the kind; to be returned if the Institution should happen to be dissolved and then sent to other like Institutions.

The East India Company have for some years been in the habit of subscribing for a certain number of copies of works relative to India, but they give the copies to rich individuals and endowed and public Libraries which would otherwise often purchase such works and the sale is thus injured. Yet under their patronage many very valuable and beautiful works have been published.

As I am almost unknown to your Lordship I may state I have had some experience on this subject, first as being the author of the *Illustrations of Indian Zoology* [Gray, 1830–1834] which was the forerunner of the magnificent works of *Lear*, *Wallich*, *Gould* (97) and others. Secondly, as the founder of the largest and most flourishing Mechanic's Institution near London, and lastly from my position in this establishment. I am constantly consulted by Authors, Artists and Publishers of the kind of works referred to. I am therefore well aware of the difficulties under which they labor and know that if this kind of encouragement was given, several works which have been deferred for years would be readily undertaken and from my experience of the feeling of the working classes I am certain it would be regarded as a great boon and that having such works within their reach would have an important effect in improving the taste and encouraging the study of Natural History and Architecture amongst them.

I may further observe; there are several Illustrated Works entirely prepared at the government expense which might be sent to these Institutions at scarcely any additional cost: as for example the Descriptions of the Marbles (containing engravings of each Statue) the Catalogues of the coins and MSS (containing engravings) published by the Trustees of the British Museum: The Report on Geology published by the Stationary Office: The Beautiful Maps published by the Ordnance Office & the Hydrographic Office of the Admiralty.

It has also been usual of late for the government to make grants to assist in the publication of certain works, as for example, the New Animals and Plants discovered in Voyages of Discovery. Under this plan have been produced the Zoology and Botany of the Arctic voyages of H.M.S. Blossom, Beagle and Sulphur, and now of the Antarctic voyage (98).

I believe the plan here recommended of subscribing for a certain number of copies would be more advantageous, as these grants in reality have only been *bounties to certain publishers*, and the works have had a very limited sale and often eventually

got into the hands of some speculating publisher of second-hand works. In conjunction with Sir John Richardson M.D. I am now editing the Zoology of H.M.S. Erebus & Terror (99) assisted by a grant from the Treasury. This work unlike others of the kind has been kept in our own hands and therefore should the government think it desirable there is no difficulty to the government receiving without extra cost 50 copies of the part as soon as completed for distribution.

In the subscription list of Dr. Falconer's & Colonel Cautley's work on the Fossils of the Himalayah (94) I see the government down for 50 copies. I do not know what is intended to be done with them, but they might be applied to the same purpose.

I am my Lord
Your most obedient Servant
John Edward Gray

To the Right Hon. Lord John Russell, M.P.
and Thomas Wise Esq. M.P.

(f. 136) contd. They [Lord John Russell and Mr. Wise] both informed me that they would take the suggestion into consideration but as yet I have never heard that the plan has not been acted on. Since that date several grants towards the publication of Natural
(f. 137) History works have been made but for some reason the grants of several have not been demanded and the works have not appeared. The one or two which have been offered have proved how completely such grants fail in the object intended. On the other hand since that letter was written, a series of Catalogues of the Zoological Department of the Museum with the sanction of the Trustees have appeared, some of them from the first zoologists of the day. I am aware that the earlier catalogues were mere lists of the species contained in the Museum but they have gradually improved in their form as the Trustees felt themselves at liberty to encourage their publication and lately some of them have grown popular and others are woodcuts illustrating the genera and showing the more interesting and newly described species contained in the Collection. They are not as yet as perfect as I could wish, as I should desire that they should combine with the scientific character of the text the higher degree of artistic talent combined with the regular degree of scientific accuracy, and as each catalogue has appeared that has been the desire aimed at.

These catalogues are sold at the cost price of production and some have had such
(f. 138) a sale (though they are only partially advertised) as to call for a second edition, and the Trustees have given them to various scientific institutions which have requested them, but there could be no difficulty in their being more extensively translated if it were considered desirable as the loss if printed a certain number of extra copies when the work is in proof is but a small item in the general cost.

One sometimes sees in the List of Subscribers to Works, some of the government offices, as the Foreign Office for example, down as a subscriber for a number of copies of Works of Travels, and I have been informed that these copies are distributed. If the plan I mention was adapted it would produce a machinery by which all the works supported by the government might be described in a definitive manner in such a way as the most advantageous to the public and author, and least injurous to the publisher and through him the general public.

Gray's difficulties and achievements

In May 1869, Gray suffered a stroke more disabling than any of the series that had started from his sixtieth year. Evidently thinking that he would not long survive it, William Flower (80), then Conservator at the Royal College of Surgeons, anticipating an obituary, wrote to Gray who dictated a reply on 14th May. Another letter to an unknown enquirer was written in 1873, and both are reproduced here. They show not only what Gray considered he had achieved, but also the difficulties that had been put in his way.

"To William Henry Flower F.R.S., Royal College of Surgeons
British Museum
14 May 1869

(f. 128a) My dear Flower

In reply to your question I send you the enclosed notes; you may use them at your discretion.

When circumstances rendered it desirable that I should study medicine I attended the lectures on Botany at Maze Pond given by Mr. William Salisbury (31). When he failed [in business] (100) I was requested by the Class (Clift being one) to finish the course although yet a lad. Being fresh from reading the very scientific papers of Robert Brown [1773–1858], of R. A. Salisbury (36) and the works of Jussieu (41) and Decandolle [de Candolle] (37) then hardly known in this country, I lectured on the Natural Arrangement of Plants of Jussieu and with my father in 1821 I published a work containing an Introduction to Botany and a Flora of Britain being the first elementary work and Flora of Great Britain published on the system. The elder botanist(s) objected to the innovation but the system is now universally adopted. I continued to lecture at Maze Pond and Hatton Garden School and gave a course at St. Bartholomew's to my fellow pupils there before 1821.

In one of my ethnological excursions I became acquainted with Dr. Leach (34) and I assisted him at the Museum between 1817 and 20 (101). I was in hope of succeeding him or rather of being temporarily employed while the situation was kept open for him in the hopes that he [would] recover but failed.

In 1822 I became acquainted with Mr. Children (58) and at his request assisted him without pay until 1824 when at his request I was temporarily employed at the Museum at a daily salary and it may be said that the present zoological collection has been formed by me. When first there I paid for the spirit and bottles out of my own pocket. Before the Parliamentary Committee of 1836 there was a small grant for Natural History generally, but Mr. Koenig spent it all for minerals, and as he had control of the fund, the share to zoology was very small averaging under £20 per ann. but this was altered in 1836 on my recommendation. The Zoological Department was separated from the other and had a grant of its own and from that time may be dated the creation of the present collection. Before 1836 the whole zoological collection was contained in a few small rooms. Mr. Children kindly allowed me to have control of the department and grant and in 1840 when he resigned I was appointed Keeper. I added the collection of osteology in 1845 when Mr. Hodgson (77) offered his collection. At my suggestion he offered the collection of skins if we would accept the bones with them and not without, the Museum accepted. Before that period Sir R. Inglis (67), at the instigation of the Curator of your Museum opposed the purchase of the bones and even our having skeletons prepared from any animal we received in the flesh as he said it was injurious to your [our] institution. Soon after I was appointed I commenced the Catalogues but I had much opposition to encounter. As the other departments did not publish them I was obliged to commence with small lists of names only, then lists with descriptions of new species and some synonyms, but I could not exceed the 12mo size. At length I was allowed to add the description of all the species and some illustrations and print them in 8vo. Then I commenced some 4to catalogues illustrated with plates, more of these would have been published but some objections were offered by Professor Owen [1804–1892] to the last and no more have been printed.

Knowing how little time I had for the work myself and how much better a person with a speciality could do the work I employed certain persons to make a catalogue of special portions of the collection, that is how Dr. Günther was first employed and how Dr. Kaup, Dr. Hagen, Mr. Desvigne, Mr. Dallas, Mr. Westwood, Mr. Wollaston, Mr. Newport and others were employed (102). It required considerable discretion to induce them to undertake such work. Lately Prof. Owen, by a new reading of the

John Edward Gray, c. 1872–1874. From a photograph.

regulation under which he claims the right to alter the MS., has caused Wollaston, Hewitson and all the other persons I employed (except F. Walker) to refuse to undertake any other work of the kind so that I can now only depend on my own labour and those of my assistants. I do hope the evil may be remedied when he sees the effect his order has produced.

No one knows the difficulties that have been put in my way whenever I tried to take a step in advance either as to extending the collection and preparing Catalogues. Mr. Panizzi (103) set his face against all printed Catalogues.

With kindest regards
My dear Mr. Flower
Yours ever sincerely
John E. Gray [in own hand]

William Flower, F.R.S.

Letter to an unknown correspondent

(f. 109) 26 May 1873

My dear Sir,

Thanks for your note and its contents. I send you a continuation of my former letter.

Yours very truly,

I have studiously avoided uniting myself to any party in Science or among scientific men, as Science is progressive, and one's opinion changes, and a party after a time becomes a defender of what is not for the best. Such a person I am aware has to pay the penalty of unpopularity, and of not having the rewards usually given to partisans, and therefore I do not make the following statement as a complaint, which no doubt would not have occurred if I had acted differently, but merely as a matter of experience.

I have had some influence on the Botany and Zoology of the country. In early life I introduced the Natural System of Plants to the English reader which is now, after fierce opposition, universally adopted. I established the Botanical Society and was President of it the many years that it existed because the members considered me the "apostle of the Natural Method". That Society was the foundation of the '*Cybele Britannica*' of Mr. Watson and the basis of the best 'English Floras' of Symes, Hooker etc. (93). I have formed at a very modest outlay the largest and best arranged Zoological Collection in existence, and conducted it in such a manner as to make it the most accessible to students of this and other countries. I have done my best to form and see after the arrangement of local collections in England and Australia. I have spent my vacations in visiting all the Museums in Europe at my own expense, and in the more important ones repeatedly to keep myself acquainted with their contents, regulations and management. I have published several scientific books, not as a matter [of] trade, but for the extension of zoology, both as works of local zoology and as Catalogues of the Collection in the British Museum. I have published several papers in the [*Philosophical*] *Transactions* of the Royal Society and more than a thousand Essays on Natural History in the different journals the larger proportion of which is in the Royal Society Catalogue, but the number is greatly increased in a private list which I have printed [Gray, 1875] independently of the many Essays on Social, Educational and Economical subjects only of temporal interest, I have not thought it worth while to keep a list.

(f. 110) I have studied every branch of Zoology some more in detail than others and have paid most attention to the part which I thought was most neglected, and I have done much to extend our knowledge of mammalia and Reptiles. [I have] collected in the Museum every class of animals, arranged them as best I could, and put them aside until a student of the parts that I could not attend to in detail should arise.

I have produced a thorough revolution in the study of Mollusca and their Shells which has been universally adopted in England, in Germany, and partially in France, for there they only make starts in science by jumps, and zoology, since the time of Cuvier and Lamarck (49), has been in a state of quiescence.

After all these exertions in the cause of Natural Science I have not been considered worthy by the Royal Society of receiving their Royal Medal. I am almost the only naturalist, a Fellow of the Royal Society, who has had papers published in the [*Philosophical*] *Transactions*, that has not received that Medal, and some have received it on very small claims, and several who have not even written papers for the Society. I believe that an aged botanist, a contemporary of my own in my youth who has published much on botany both in the Linnean Society *Transactions* and independently but has not published a paper in the [*Philosophical*] *Transactions* of the Royal Society, has been equally forgotten with myself.

Social and cultural interests

That the conditions under which Gray served his apprenticeship predisposed him to question social conditions, is evident from what he records in his *Autobiography* of his adventures as a surgeon's assistant at Wapping, and by his concern as a young man for the abolition of the slave trade and for prison reform. After 1826, marriage and residence at Blackheath brought him into the affairs of the local community and into local government. That year he went on his first continental tour (he had been to Paris to study before), returning with broader cultural interests, which took the form of concern for some neglected portraits in Montagu House.

Royal portraits

(f. 74) [In 1827] I had to go to the attics of Old Montagu House for Mr. Children (58), who like the Officers, had a room there. I observed a large series of oil pictures without frames and in the passages a number of frames without pictures. At my leisure I fitted the pictures to the frames and hung them up over the book cases of the rooms that were occupied as studies of the Zoological Department, placing the series of Kings in the largest room and the other pictures where they would best fit. I incurred a good deal of ridicule because I placed the picture of Oliver Cromwell in the series of Kings.

It is an instance of the perverseness of man, showing how one gets punished for good actions. When they were moved into the New Gallery [of the new British Museum] over the King's Library, the upper part of the room was set aside for the series of pictures which they now occupy (104), so that the Zoological Department was deprived of space by my taking care of them, as they occupy the part of the Gallery which in my plan was intended for the cases of fish, reptiles etc. in spirits arranged in opaque cases. It is to be hoped some day that the greater part of them indeed all that are worth keeping will be incorporated with the National Portrait Gallery which they would much enrich.

Mechanics Institutes

(f. 12) After my marriage [in 1826] I lived at Blackheath (105) and took an interest in my
(f. 77) neighbours. One day Mr. Mallet informed me that the Society (106) which had existed for several years was going to meet that night to be dissolved. I went at the time appointed, introduced myself to the few persons present, among others, to Mr. John Bennett (107), one of the Secretaries, the present Sheriff of London, and proposed that the Society should be kept together for at least another year and that instead of being dependent upon subscriptions and donations, the members should put their shoulders to the wheel and depend entirely upon their own exertions; that I and a few of my friends would join the Society as members but would only pay the common subscription and act as the other members of it.

We gave lectures, established a lending library to which I lent, but afterwards gave a few hundred books. The Society soon became a success, the only difficulty we had to encounter was the opposition of the established clergy of Greenwich and their supporters. They succeeded in getting us turned out of two or three school rooms rented to lecture in. Eventually the Society built a theatre, most excellent reading rooms which Mr. Wise said were better than any then existing club in London and a large school attached to it. The Society is still prospering though most of the Institutions of the same kind called Mechanics Institutes or some similar name have ceased to exist.

After the passing of the Reform Bill [in 1832] I took some interest in the election for West Kent and also the Borough of Greenwich (108). Some of the members of the Greenwich Society consulted me whether I would stand for the borough but I at once declined as it would be inconsistent with my duties and interfere with the object I had set myself to perform. A larger party memorialised the Government that I should be put in the Commission of the Peace. I had some communication with the Government, but declined from the cause above cited, but at the same time recommended as more fitted for the occupation my friend Mr. Thomas Lewin, a barrister and man of leisure and brother-in-law of Mrs. Grote. He was appointed. The Conservatives wished to know if I would accept the being named as a member of the Turnpike Trust, but I declined on the same grounds, feeling sure that I never could attend either as a magistrate or trustee except on particular occasions when I should have to vote on a party question.

Life saving

(f. 17) When in Hamburg [in 1831], having observed that they used a wicker boat covered with hide and having an open well in the centre for the recovery of persons who had fallen into the water, I purchased one of these boats and presented it to the Royal Humane Society (109) and this boat served as a model for all improved machines that are now in use for the recovery of persons who have fallen into the water by which they are taken out of the water by a [boat] with a central vacancy and not as formerly from a side of a boat. The Humane Society elected me an Honorary Life Member (110) for the interest I had taken in the subject.

Shortly afterwards M. Le Roi d'Etoile [sic] (111) was staying with me and drew my attention to a pamphlet that the use of bellows for the recovery of drowning persons if employed effectually was sure to kill them, even if they were not drowned. [In 1832] I sent a pamphlet to the Humane Society and finding out they did not understand French, I had it translated for them. Not hearing that they had taken any steps to put an end to the use of the bellows, I wrote to them again and found that I had made a mistake in supposing they had immediately adopted the conclusions of the pamphlet,

(f. 18) and was informed that if they did, it would have a bad effect on the Society (112), they overlooking the fact that anyone who searches the history of the Society will find that with the improvement in knowledge, almost all the means they had at one time recommended for the recovery of persons, had gradually been moved into the list of means that were to be avoided like the hanging up by the heels, and rolling in a cask.

On thinking on the question it appeared to me that artificial respiration might be induced by the regular alternate compression and relaxation of the chest, and I found it quite successful in the case of a child that had fallen in the water, when I used a long towel tied round the chest with a stick inserted so that the chest was contracted [when] twisted, and it dilated of its own elasticity when untwisted, but this was too simple for the Society or rather I had lost their confidence. They referred the question to a Committee of medical men and they recommended that the chest should be contracted by a bit of linen torn into strips at each end, and interlaced, and each end to be pulled by a separate person, not seeing that it would not act without the operators acting in

unism, a thing very difficult to obtain especially between two strangers, whereas the single towel and the stick was like a tourniquet and entirely under the control of a single operator.

Insanity

(f. 13) Experience has taught me that it was necessary, if I was to retain my mind in a fit state to do its work, that I should vary my labours by taking up now and then some object of study.

My medical education has made me take interest in the health of towns and in the improvement of Sewage. At length the Government saw the necessity of undertaking this question (113) and I received an offer from them to be appointed Officer of Health. I stated I did not wish to give up my present appointment and duties, but I recommended a young medical man whom I had known for some time and believed to be fitted for the post, and he was appointed.

In the same manner I took a great interest in the treatment of the insane. As the treatment of the private madhouses and charitable institutions had been improved, I observed that of the Army and Navy was carried out in the old barbarous system. I did my best to call the attention of the Government and to interest the officers in charge of these institutions in adopting the improved method, and got my friend, Sir J. Richardson (99), to bring the question of the management of Haslar before the Admiralty, and took him to see the lunatic asylum at Hanwell under the direction of Dr. Conolly (114). Dr. Richardson made several reports upon the great improvement in management and on the diminution of expense to the Admiralty, who at length gave him directions to introduce it into Haslar Hospital that was under his charge and he recommended that his assistant, Dr. Anderson should be appointed to carry the alteration into effect and we had the happiness of seeing its beneficial influence on the patients.

Penny postage

On the subject of Penny Postage (or rather what led up to it in its final form) Gray wrote or dictated no less than six versions of what he considered his contribution to have been, and like that in his *Hand Catalogue of Postage Stamps* (Gray, 1862), not all are carefully expressed, so that there is little to be gained by placing the versions along side each other. The present writer would not go further than to admit Gray's claim that, after reading H.B. Parnell's (1846–1891) *On Financial Reform* (Parnell, 1832), he suggested a 'small uniform rate of postage be *pre-paid* by stamps' at the receiving office.

(f. 139) I am well aware that the best of schemes even such as are declared to be the greatest benefit to humanity and when once established and gradually become of very general adoption require long and continuous agitation before they can be adopted. This is well illustrated by the "Penny Postage" . . . I don't mention this subject with any intention of claiming any part of his (Sir Rowland Hill's) well earned reputation for
(f. 140) I never could have bestowed even if I had the talent, the labour which he devoted to the subject without neglecting my duties at the Museum, the improvement of and the extension of the usefulness of which was the aspiration of my early youth and has been my continued desire.

(f. 15) Having read Parnell's [Baron Congleton] work on Taxation and then having seen that stamps were the most economical system of collecting money for fiscal purposes and observing that newspapers were carried by the post when stamped, it occurred to me that stamps might be beneficially applied to the postage of letters. When Mr. Hill (115) had shown that the distance which letters were carried was a very small part of the expense and he proposed a uniform rate of postage, I suggested and used my best endeavours to have that postage collected by stamps, but my chief opponent was

Mr. Rowland Hill, who in both editions of his pamphlet and in his evidence strongly urged the advantage of the postage being paid in money, but when he found that the
(f. 16) issue of stamps was to be tried, he recommended the adoption of a pictorial envelope (116) which so disgusted the public that it was obliged to be given up, and the stamps became universally used in its place.

The use of stamps has been adopted for collecting various other duties, and in nearly all the different parts of the world. Oddly enough Mr. Hill, who recommended the penny postage on the grounds of its economy, seems to have been alarmed at his own plan, and urged the use of stamps being left optional, so requiring a large staff to keep the account of unpaid letters sent to or from the different post offices, which as I have repeatedly pointed out, might, by a very simple arrangement be obviated, the postage on unpaid unstamped letters being collected by the post-master of different places who had to deliver them, he putting on stamps for the postage and receiving the money for the stamps so put on, from the receiver.

John Edward and Maria Emma Gray were among the first, and were perhaps the first joint, stamp collectors. Unable to resist making a catalogue, Gray's *Hand Catalogue of Postage Stamps* (1862) was among the first five to be issued in Britain (117). The Catalogue went through four editions before being taken over by a professional editor, Overy Taylor in 1870.

(f. 14) I collected the postage stamps used in different countries and finding that the collection of them became a kind of rage and that it might be useful in extending a knowledge of geography among the public, I printed a Catalogue of them. This Catalogue has gone through several editions and now seems to have supplanted several imitations of it, that were published.

Decimal coinage

(f. 14) [In 1853] I became interested in the agitation to introduce a decimal system of coinage. I wrote a letter that appeared in the *Times* (118) on the Poor Man's Penny, and at length took such interest in the question that I collected all the books and papers written on different sides of the question, and made a collection of the various coins in circulation in different parts of the world. I placed these collections at the disposal of the Royal Commission (119) appointed to examine into the question, which for a time occupied considerable attention.

During the time of the discussion the Master of the Mint died, and it appears to have got abroad that I was a Candidate for the situation from the attention that I had paid to coins and coinage. I received a visit from Dr. Graham (120) and Mr. Brande (121), who were both candidates to know if there was any truth in the report. I soon put their minds at rest by informing them that I only studied the subject of coin and coinage as a diversion and was satisfied with my present position. I suppose that my letters and evidence on this subject showed that I had mercantile capabilities for I had offers from more than one commercial house to join them and to become a Director of more than one Company.

On Francis Galton's eminent men

In 1874, within a year of his death, Gray was reading Francis Galton's (1822–1911) recently published *English Men of Science, their Nature and Nurture* (1874). Partly paralysed, and unable himself to write more than a few words, he dictated the reactions which illustrate his social philosophy. In his solution to the problem of human betterment, Galton inclined to favour an 'elite' of an educated upper class, but in this volume he fell into a strange contradiction which Gray, whose concept of society did not include an 'elite', was quick to spot. Galton could not both claim that his upper class was replenished from below, which had been a constant feature of English society, *and* that his lower class remained as a 'residuum' (see f. 41 below).

In making his case Gray named eight scientific institutions (see 39 and 42 below) which, in 1874, employed about forty scientific men and mathematicians. On a recent analysis, as far as it can be made, it seems these men received education at one of three 'levels', to a great extent representing their social class:

		Nos. involved
Upper Level	University or medical	14
Middle Level	Good school and/or parent having some means of influence to guide career	17–19
Lower Level	Boy from poor home, making own way	7–9

Those educated at a 'lower' level, whom Gray may have had in mind in showing that ability was no monopoly of class, were:

Thomas Davies (1837–1892), mineralogist, British Museum.
N. E. Brown (1849–1934), Royal Botanic Gardens, Kew.
John Lindley (1799–1865), botanist, University College, London.
Henry Keeping (1827–1924), Woodwardian Museum, Cambridge.
W. C. Williamson (1816–1895), natural history, Owen's College, Manchester.
John Phillips (1800–1874), geologist, Oxford.
William Ellis (1828–1917), Royal Observatory, Greenwich.
William C. Nash (1841–1926), Royal Observatory, Greenwich.

As Gray realized, his family over the generations was in no way inferior, in spite of the poverty of his father, to the Galtons, and having himself risen the hard way, Gray found himself more in sympathy with the self-made men of the period than with any, so-called, 'elite'. What Gray had lacked in education remained as a recurrent irritant in his mind.

In childhood, illness and poverty had combined to deny him formal schooling, mainly in literature and the classics, while his medical education had been of such a nature as to place it below an accepted university level. Hard though his years from 16 to 23 had been, however, a university could hardly have given him more.

(f. 32) I understand, when I received Mr. Galton's questions, that the answers were to be published and therefore only wrote on the form what appeared fit for that purpose, but Mr. Galton seems, when he saw the answers, to have changed his mind, and to have only published extracts from them anonymously, and I think when one sees many of these extracts that he has judged wisely. He very truly observes, p. 147, that many of his answers were "due to reticence on the part of the writers" and "Again many men are conceited, but their differences" do not much affect those results.

(f. 33) The replies Mr. Galton has received to his printed questions were 180 and he has selected rather more than 100 of these for statistical treatment, and he states "It must not be for one moment supposed that mediocrity is unduly represented in my data." (p. 11).

(f. 34) One-third of those who sent replies have been educated at Oxford or Cambridge, one-third at Scotch, Irish, or London Universities, and the remaining third at no university at all. I am totally unable to decide which of the three groups occupies the highest scientific position: they seem to me very much alike in this respect. (p. 236).

A curious admission considering the author's predilection for a university education, and I think it is a proof that the answers he has received are not a fair test of scientific merit, at least as far as regards natural science – according to my experience. Some of

(f. 35) the answers, for example, are extraordinary. Thus it is given as proof of energy (Chapter II):

7. Strong when young – walked many a time fifty miles a day without fatigue, and kept up five miles an hour for three or four hours. (p. 80).

21. When a boy of 13, I walked 48 miles in one day, 50 miles the next, and about 20 miles the third. (p. 88).
As a boy, I worked for three months all day and all night, with not more than four or five hours sleep. (p. 93).

8. When under 20, I have walked 20 miles before breakfast; when about 32, walked 45 miles; dined and danced till 2 in the morning without fatigue. At the age of 26, during 14 days, was only 3 hours per night in bed, and on 2 of the nights was up all night preparing for . . . [certain scientific work.]

(f. 36) At aet [age] 6, I was given Joyce's *Scientific Dialogues* (122), which I soon mastered, then other books; before aet [age] 8, I commenced making star maps; aet [age] 12–13, I made some geological sections with tolerable correctness: and so on. (p. 176).
He (Rowland Hill) was noted in youth for powers of mental calculation and in some points was superior even to Zerah Colburn (123) and George Bidder (124); thus he could mentally extract to the nearest integer the cube root of any number not exceeding two thousand millions. (p. 53).

I suppose it was such accounts that Mr. Galton means when he speaks of "too emphatic narration of early achievements." (p. 147). Indeed I cannot say that the replies confirm Mr. Galton's estimate that vanity in scientific men is at its minimum. (p. 148).

(f. 37) It appears to me that the answers Mr. Galton received cannot be a fair representation of the typical scientific men of the country. First of all I do not think that his definition of a scientific man is very conclusive, and certainly excludes sundry men who take a high station in science.

There are men who certainly have done work, but have not received a medal, and there are other scientific (125) men who do not belong to Dining Clubs; indeed it appears to me that a great part of Mr. Galton's method of selecting scientific men seems rather to belong to the social qualities than to their scientific eminence. A (f. 38) different criterion of eminence is found in the number of eminent men reared in the universities whither a large proportion of the highest youths of the nation find their way.

(f. 39) For example, at least 3 of the Professors of Natural Science in Oxford did not receive a university education and it is natural to suppose, if they were capable of finding a member of the university, they would rather choose him than select a man who has been engaged in trade for the greater part of his life. In Cambridge they have selected for the arrangement of the Woodwardian Museum men who were not educated in the University. In University College and in King's College (London) the Professors of Natural Science have not received a university education nor even have been educated in their own schools.

(f. 40) The Keepers of the departments in the British Museum, belonging to Natural Science, and the Superintendent of Natural History, have all but one not received a university education, neither have the assistants of any of them, even of the keeper belonging to Oxford, and it is the same with the keepers of the other departments of that Institution – there being only one or at most two university men among them. It is natural to be supposed, considering who has the patronage, that university men, if they had the qualifications, would be appointed. Perhaps we shall read Mr. Galton's remark as a prophecy of what he hopes will be the future and not as a description of what is.

In the first chapter of his work, entitled *Antecedents*, Galton outlined the basis of his thesis and discussed the 'Occupation of Parents and Position in Life', in relation to their offspring. Galton concluded that:

> It is by no means the case that those who have raised themselves by their abilities are found to be abler than their contemporaries who began their careers with advantages

of fortune and social position. They are not more distinguished as original investigators, neither are they more discerning in those numerous questions, not strictly scientific, which happen to be brought before the councils of scientific societies. There can be no doubt but that the upper classes of a nation like our own, which are largely and continually recruited by selection from below, are by far the most productive of natural ability. The lower classes are, in truth, "the residuum". (p. 23).

Gray's reply to this thesis of Galton's was emphatic:

(f. 42) I must say that this is the direct opposition to all modern history, and certainly opposed to my own experience. Thus the origination of the Arkwrights, the Rennies, the Brunels, the Stephensons [George and Robert]; Smith, the geologist; Black, Priestley, Davy and Faraday, the chemists; R. [Robert] Brown, Lindley, Hooker, [the botanists]; Wallich [oceanographer] had not fathers, or when they began life, did not possess the advantages of fortune or social position, they did not belong to the upper class; [yet] they have been great improvers of science and although some of them have founded families, all belong to Nature's Aristocracy.

(f. 42) I would observe from my own experience that the majority of the Keepers and of the senior and junior assistants in the Museum, and the scientific assistants in Kew Gardens, three of the professors of Natural Science at Oxford, the Professor of Natural Science at Owen's College and the Professor of Natural Science at the University College and King's College and several of the assistants at the Royal Observatory who, one would suppose, are chosen for their knowledge of the subject. They have made use of the opportunities that their situations have given them to make themselves leaders and improvers of the sciences which they study and teach. Their fathers and they had not at the time of their appointment the advantage of future social position, and one might quote very many other instances, but it would be invidious to do so.(126)

Personal reflections

Although Gray did not write much about himself as a person, except in his letters, for instance to Mrs. Rose Mary Crawshay (1828–1907) (Gunther, 1975, chapter 15), there is generally a strong subjective element in what he wrote about his work.

(f. 110) I do not know anything more difficult for an individual to describe than his own peculiarities. There are so many causes for his misunderstanding himself, but, judging from the observations and remarks of others, I should say that my character consists as if often the case of two very opposite qualities. First I am fearless and very obstinate in doing what I think is just and almost genuinely affectionate to those who are in distress and wanting my assistance, as is well expressed by Dr. Sharpey (127) who observed, that "Gray is said to be a quarrelsome man, but that is scarcely a fair description of him. He will knock you down if he thinks you unjust or untruthful (128), but at the next minute he will give you his hand and be your friend if he thinks you want his aid."

On the working of the mind

(f. 6) I believe that with energy and a well balanced mind, which generally produce business habits, a man with a scientific turn of mind may study with advantage any branch of science and change them [his habits] according to circumstances, or as he sees it to be to his advantage. That is the result of my own case.

(f. 11) [In 1829] I undertook, if General Hardwicke (129) would give to the Trustees for the Museum his collection of drawings and such books in his library and specimens in his collection as were desirable, that I would figure a selection of the animals drawn under his direction and to publish a Fauna of India (130). I worked at them at home of a night after I had finished my duties at the British Museum during the day. It was

all very well for a time but at length my mind was overworked and gave way. I struggled against it as long as I could, but at length determined on giving up doing more in zoology than was absolutely necessary at the Museum, and determined to try the effect of changing my occupation and oddly enough, as many people will think I took to the study of theology and with such energy that I had thoughts of becoming a missionary rather of the Moravian type (131), but by degrees as my mind recovered its tone, I returned to the study of zoology.

The overworking of the brain on the same subject produces fatigue of the brain more permanently than is generally suspected. During the time I have been Keeper of Zoology 4 Assistants have suffered more or less severely from this dreadful malady.

It was Maria Emma Gray who was the pianist and concert-goer, but doubtless John Edward turned his mechanical talents to improving the instrument, and it would have been unlike him not to suggest that Miss Broadwood adopt his ideas as the following note suggests:

(f. 53) You may add that Dr. Gray was much attached to the study of music and introduced some improvement in the construction of the piano which we [offered?] to Miss Broadwood (132).

Zoological manuscripts

The drawings and other illustrative material assembled by J. E. Gray and held by the Zoological Library of the British Museum (Natural History) show the style of work he adopted when he joined Children at Montagu House in 1824. The first task Children gave him was to compile a Catalogue of Reptiles (Gray, 1825); but it was clear that he soon decided that the whole animal kingdom should fall within his demesne with the object of building up a *Systema naturae* on the Cuvier model. The method adopted was to cut illustrations out of whatever printed sources were available, stick them on stout cartridge paper sheets of standard size ($8\frac{1}{2}'' \times 10\frac{1}{2}''$) (21·5 cm × 26·7 cm) (identified today by watermarks of 1824, 1825 and 1826), label them, add a reference or two and notes as he went along, and occasionally a drawing or tracing of his own. How many genera he made folders of we do not know, but of his *Systema* there are still preserved many hundred sheets in total for Mammals, Birds, Reptiles, Shells, Crustacea, Mollusca and Protozoa.

The most complete example of Gray's method is seen in his work on Mammals, the group to which he contributed most. His *Systema naturae*, built up of cut-outs pasted on cartridge sheets fills five boxes (88.q.G: Wm. 1824–1826) which gave the foundation for his volume on the Mammalia, being Volume 5 of E. Griffith's *The Animal Kingdom* (Gray, 1827).

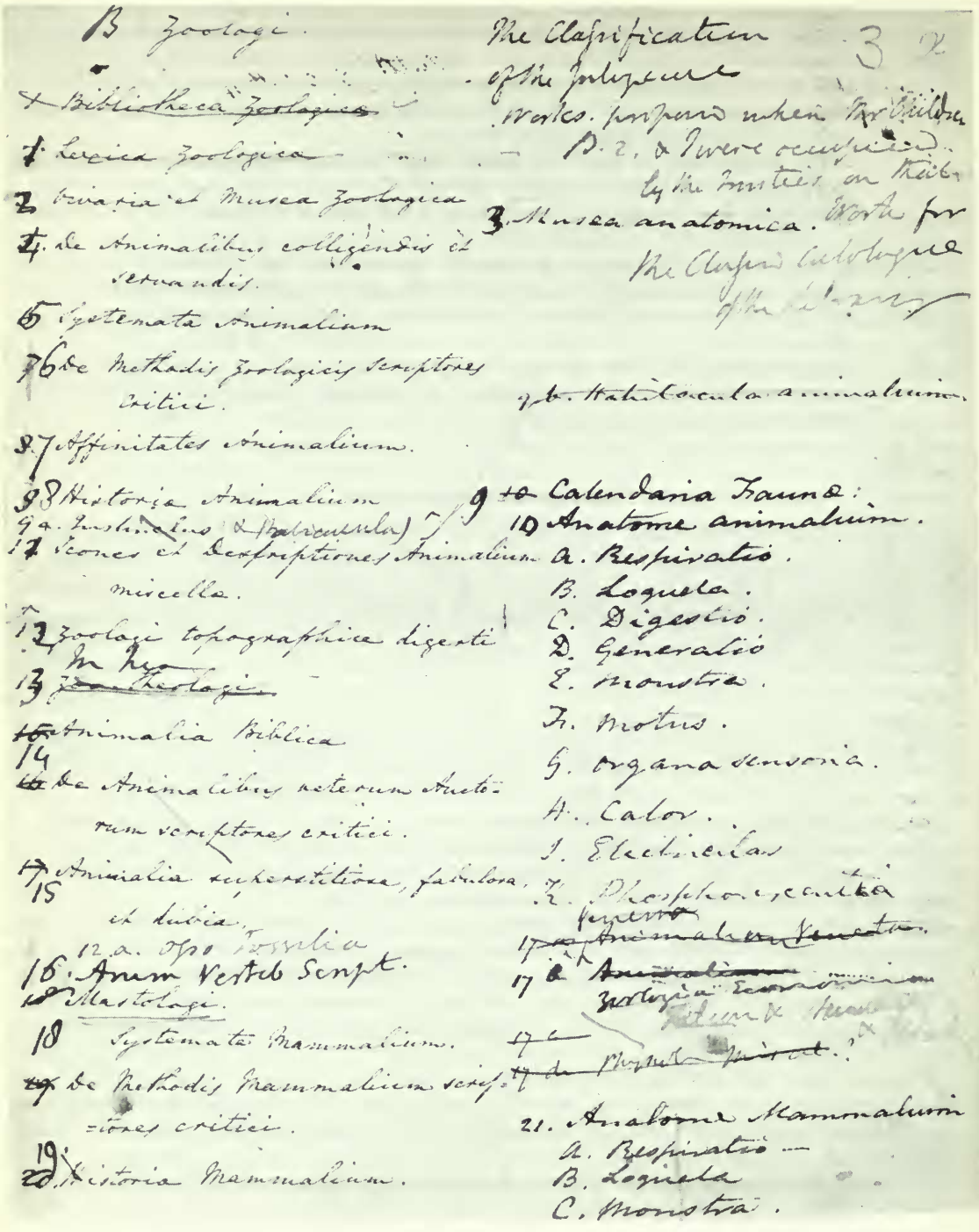
There is usually a documentation gap between this early *Systema* and the first formal List or Catalogue. For Mammals, the List was preceded by four pocket-size account books (89.d.G: Wm. 1842) with notes from literature and foreign museums (presumably made on visits to the Continent), all of which developed into a later *Listing Mammals in Systematic Arrangement* (89.o.G: Wm. 1837) going up to the year 1842. The first catalogue (called a *List* at the time) is dated 1843 under the title of *List of the Specimens of Mammalia in the Collection of the British Museum* (Gray, 1843).

Whenever Gray started to lay a foundation for any group, the same procedure is followed: for birds, reptiles, mollusca, crustacea, etc. Birds have no less than seven folders, the cut-outs coming mainly from: Latham (1781–1787), Pennant (1776–1777), Bonnaterre (1782–1832) and Griffith (1827–1833).

No list or catalogue was made of birds as their care in the Museum passed to Gray's brother, Robert in 1831.

Reptiles go through the same process with a build up of cut-outs on cartridge sheets with watermarks of 1824, 1825, which in their case led to a *Synopsis of the Genera of Reptiles* of 1825 referred to above, and to the *Synopsis reptilium* of 1831 and 1834 (Gray, 1832 and 1834).

To give an idea of how much may have been lost, there is, in the case of Reptiles, little material between the build-up for the Synopsis of 1825 and a collection of material made about 1870–1873



The Classification of Zoological Works. A draft for a proposed classed catalogue of the British Museum Library in Gray's hand. Left hand column c. 1825, inscription top right c. 1860.

for the *Hand List of Specimens* of 1873 and subsequently (Gray, 1873). The exception is the preservation of a sheet of notes in Gray's hand attached to a list of reptiles made by Darwin on the *Beagle* (1832–1836) which came to Gray through Thomas Bell (89.f.D), one of the few links between Darwin and Gray (133).

What may be remarked upon is the fact that so many, indeed the majority of the sheets and cut-outs, laboriously built up since their compilation in the 1820s, should have remained untouched since, as if they formed a canon not to be disturbed, for one would have thought they would have received annotations over the years, even decades, unless as each catalogue was produced, it became in its turn the *Systema naturae* for each group.

Only in one case, it seems, was the illustrative material gathered between the 1820s and the 1870s rearranged for purposes of study; and this was for the *Cetacea and Sirenia*. Thus, in two volumes (bound or re-bound in 1964/65) is found anything from an eighteenth century cut-out, through a letter from Jonathan Couch, to plates of the 1860s. This, like the other manuscripts mentioned here, is preserved in the Zoological Department archives.

Acknowledgements

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Notes

(1) Group portrait by A. Archer, 1819. The Temporary Elgin Room, British Museum, at the British Museum (Gunther, 1975 : 38).
(2) The relations between Children and Gray at the personal as well as at official levels have been discussed in Gunther (1977).
(3) Samuel Gray IV (1694–1766) of Pall Mall, London. Seedsman and importer of plants.
(4) John Ray (1628–1705). There is no evidence to support a relationship, unless as a collateral (Raven, 1950).
(5) Carlton House, Pall Mall was built in 1788, and pulled down in 1828.
(6) Ravensbourne River, between Deptford and Lewisham.
(7) Charing Cross. In another passage (folio 55) Gray writes that the 'glass cutting part of the business was carried on by the ancestor of the present [1870] celebrated Glass Cutters at the corner of Pall Mall East'.
(8) In another text Gray gives Yorkshire. Gray visited both, but Pembrokeshire seems more likely.
(9) Dr William Hunter (1718–1783).
(10) At the Factory House in Oporto, Portugal, from 1773 to 1778.
(11) Gray resigned as Secretary at the British Museum in December 1805, but retained the other two offices until his death.
(12) Sir Humphrey Davy (1778–1829), three papers in *Phil. Trans.* 1788, 1789 and 1796 and two Croonian lectures, 1785, 1786 (Gunther, 1976).
(13) Eldest son, Francis Edward Gray (1784–1814) m. Miss Maria Emma Smith (1810) who became wife of John Edward Gray (1826); second daughter m. Taylor Combe (1774–1826); Juliana Gray, elder daughter (1775–1837), unmarried; William Herman Gray (1794 ob. inf.).
(14) The child was brought up at Charlton in Kent, the mother retiring to the neighbourhood of Greenwich on account, perhaps, of the family connections in that region.

(15) Dr Robert Nares (1753–1829), philologist, who had worked in the British Museum as Assistant Librarian, and may have got Samuel Frederick Gray work there after his return to London in 1804.

(16) Elizabeth Forfeit (1777–1852), daughter of a picture dealer in Maiden Lane, Covent Garden.

(17) The real reason for the breach, though temporary, is not known, perhaps it was because Edward Whitaker's marriage had been an unhappy one and he did not consider Samuel Frederick's health conducive to marriage.

(18) Dr Joseph Priestley (1733–1804) may have employed Samuel Frederick *before* he went to Walsall, but not in Birmingham where he worked with a Dr Black, as Assayer, of whom nothing is known.

(19) Dr Charles Hatchett F.R.S. (1765–1847), chemist and mineralogist, coach maker in Long Acre, a friend of Edward Whitaker Gray who, when Keeper in the British Museum, arranged the acceptance of the Hatchett mineral collection, the most important of that period.

(20) George Robert Gray (1808–1872) Assistant Keeper at the British Museum, ornithologist.

(21) Charlotte Frances Gray (b. 1811) m. Samuel Birch (1813–1885) Keeper of Oriental Antiquities at the British Museum.

(22) William Thomas Brande, F.R.S. (1788–1866), chemist and apothecary; successively, at Apothecaries Company, succeeded Sir Humphrey Davy at the Royal Institution, Chief Officer of Coinage at the Mint, Secretary of the Royal Society.

(23) Mr Wyatt was also employed in the Patent Repository.

(24) Mr Pratt (or Mr Prance) appears to have succeeded Francis Colombine (not Valentine) Daniell (1765–c. 1825) in the Wapping Pharmacy. Daniell, a native of King's Lynn, had practised in Wapping since 1788. He claimed to be the inventor of the Life Jacket, for which he was made a baronet and awarded the Gold Medal of the Society of Arts. *The Times* of 21 July 1806 recorded an exhibition of Daniel's Life Preserver, which supported the subject at the surface of the water. He was also the innovator of the 'Medicine Chest for Sea', provided with a proper selection of the articles required; and he wrote a treatise with practical directions for diseases common to seamen. Gray's interest in life preserving is likely to have been derived from his predecessor in the Wapping Pharmacy. (*Encyclopaedia Britannica, Supplement to the fourth, fifth and sixth editions*, vol. 6, 1824 : 361 and Gray *c.* 1862 : f. 21.)

(25) John Rennie (1761–1821), one of the great civil engineers of the period, at the time being engaged on the London and East India docks on the Thames. Buried in St Paul's, London.

(26) James Francis Stephens (1792–1852) leading entomologist of the period.

(27) Merriman, no information.

(28) Edward Granger (1797–1824) and Frederick (1791–1864).

(29) David Unwins (1780–1837) of the City and Finsbury Dispensaries.

(30) William Kingdom (d. 1863) surgeon.

(31) William Salisbury (d. 1823), author of botanical works, lectured at Maze Pond, etc.

(32) William Curtis (1746–1799), of the Society of Apothecaries; *Praefectus Horti*, and Demonstrator in Botany at the Chelsea Physic Garden, etc., author of *Flora Londoniensis*, 2 vols, 1777–1798.

(33) William Clift sen. (1775–1849) Secretary to John Hunter, physician; from 1800 Conservator of the Museum of the Royal College of Surgeons; F.R.S. 1823.

(34) William Elford Leach, M.D., F.R.S. (1790–1836), at the time 'Assistant Librarian' (later Assistant Keeper of the Natural History Collections) at the British Museum, Montagu House.

(35) Sir Joseph Banks (1743–1820) of 32 Soho Square, London. This is the only reference Gray makes to attending the famous breakfasts.

(36) Richard Anthony Salisbury (1761–1829), botanist.

(37) Augustine Pyrame de Candolle (1778–1841).

(38) M. F. Dunal (1789–1856).

(39) *Thompson's Annals*, or *Annals of Philosophy*, a reference to the paper by Gray, S. F., 'Historical Sketch of improvements in physical science', in issue of August 1820, pp. 115–130. (See Gray, 1875, item no 1).
(40) S. F. Gray under whose name *A Natural Arrangement of British Plants* (1821) was published, was the sole author of part I in volume I, the rest being John Edward's work under his guidance, helped by Samuel Forfeit, at that time working at Apothecaries Hall. (See Gray, 1875, item no 4a).
(41) Antoine Jussieu (1748–1836), *Genera plantarum*, 1774.
(42) Dr John Lindley (1799–1865), author of *Introduction to the Natural System of Botany*, 1830.
(43) William John Burchell, D.C.L. (1781–1863), explorer and naturalist. (See also note 81.)
(44) R. A. Salisbury's MSS. were edited by Gray under the title of Genera of Plants, London 1866 8vo. Salisbury's drawings are preserved in British Museum (Natural History) Botany Library, under 582.4/SAL/Q. (See Gray, 1875, item no 719).
(45) A. H. Haworth (1768–1833), a friend from the Little Chelsea days.
(46) N. A. Vigors (1785–1840), F.R.S., M.P. first Secretary of the Zoological Society 1826–1833.
(47) The President was its founder, Sir James Edward Smith (1759–1828).
(48) The Bishop of Norwich who proposed the toast was Edward Stanley (1779–1849), an amateur naturalist of distinction. The year of the anniversary dinner is unknown, but probably after Gray became Keeper in 1840. He was elected to the Linnean Society on 7 April 1857.
(49) Baron Georges Cuvier; Jean Baptiste Lamarck (1744–1829); P. A. Latreille (1762–1833).
(50) *Encyclopaedia Britannica*, Supplement 1815–1824 and Sixth Edition 1823; and *Edinburgh, Encyclopaedia*, edition of 1830, p. xii, the volumes appearing from about 1808 (Sherborn, 1937).
(51) Charles König (1774–1851), became Keeper of the Natural History Collections in 1813.
(52) House of Commons, Select Committee of 1835, 1836.
(53) 'Mr. Samuel', so written by Gray perhaps out of contempt, was George Samouelle (d. 1846) (see Gunther, 1977).
(54) Alexander MacLeay (1767–1848), Secretary of the Linnean Society.
(55) Samouelle, G. 1819. *The Entomologist's Useful Companion, or an Introduction to the Knowledge of British Insects*. London, 496 pp.
(56) James Sowerby, the elder (1757–1822) (MacDonald, 1974).
(57) *The Mechanics Weekly Journal* appears to have been sponsored partly by S. F. Gray but was suppressed by its competitors after appearing between November 1823 and May 1824.
(58) John George Children, F.R.S. (1777–1852) was appointed to succeed Dr Leach in 1821 (formally 8 March 1822).
(59) Capt. F. W. Beechey (1796–1856), in command of H.M.S. *Blossom* during voyage of 1825–1828 to circumnavigate the globe.
(60) General Edward Sabine, F.R.S. (1788–1883), later President of the Royal Society.
(61) Francois Péron (1775–1810); C. A. Le Sueur (1778–1846).
(62) Sir Henry Ellis (1777–1869), Keeper of Manuscripts, 1812–1828; Principal Librarian, (1828–1856).
(63) Gray gave evidence in July 1835 and again in April 1836.
(64) Sir Benjamin Hawes (1797–1862), Member for Lambeth, sponsored the Committee, which became known as the Hawes Committee.
(65) Although in 1836 Gray was still only as an assistant to Children at 15/- a working day, most of his recommendations were accepted by the Committee, which brought an adjustment to his salary. Not all the Committee's recommendations were, however, accepted by the Trustees.
(66) Mr 'Samouel's' [Samouelle's] case was investigated by the Committee (29 July 1835) leaving little credit to his sponsors.
(67) Sir Robert Harry Inglis (1786–1855), Conservative politician.
(68) John Edward Gray succeeded as Keeper of the Zoological Department on 11 April 1840, and retained the position for 35 years.

(69) Francis Walker (1809–1874) (Gunther, 1912: 8).
(70) E. A. Smith appointed in 1867 as a personal assistant to Dr Gray, for the Mollusca and 'Lower Animals'.
(71) Albert C. L. G. Günther, M.D., F.R.S. (1830–1914) joined the Museum in 1857 to work on fishes, and became Keeper of Zoology in 1875.
(72) This was arranged in 1862 by Albert Günther through his friends in the *Konigliches Naturalien-Kabinet* at Stuttgart.
(73) About 1870.
(74) Dr Eduard Rüppell (1794–1884) traveller and naturalist. In Abyssinia from 1830 to 1834.
(75) Admiral Sir John Harvey (1772–1837) was on the West Indian station for much of his time.
(76) The British Association met at Cheltenham in 1856, and Professor John Phillips (1800–1874) had been appointed Keeper of the Ashmolean and University Museum in 1854, and Professor of Geology from 1856; his lapse of memory is surprising. Phillips was the first professor to accept Ruskin's concept of what a natural history museum should be (Mallet, 1927 : 361–367). It would have been interesting to have had Gray's comment.
(77) Brian H. Hodgson (1800–1894) British Resident at Katmandu, Nepal (Gray, J. E. and G. R., 1846).
(78) Hugh E. Strickland (1811–1853) (Jardine, W., 1858).
(79) Before 1845, osteology was the preserve of the Royal College of Surgeons and it was Gray who suggested to Hodgson that he should make it a condition that the Trustees must accept his osteological specimens if the Museum were to have the remainder of his collection.
(80) William Henry Flower, F.R.S. (1831–1899), from 1861 Curator of the Hunterian Museum, and from 1870 Hunterian Professor at the Royal College of Surgeons; Director of the British Museum (Natural History) from 1884 to 1899.
(81) William John Burchell (see also note 43) travelled in Southern Africa 1811–1815.
(82) Major Charles Hamilton Smith (1776–1859), soldier and writer on natural history; retired to Guernsey 1820.
(83) Reference should read: Martius, C. and Piso, G. 1853. *Versuch eines Commentars über die Pflanzen in den Werken von Marcgrav* (1610–1644) *und Piso über Brasilien* . . .
(84) As this was written some fifty years after the appearance of Burchell's volumes, Gray's memory may have been at fault (Burchell, 1822–1824).
(85) Burchell was in Brazil from 1826 to 1828.
(86) Dr Rüppell returned from Abyssinia in 1834.
(87) Lord Derby's (1799–1869) collection at Knowsley Hall given to Liverpool in 1851. (See Gray, 1875, item no. 311).
(88) Prince Massena's collection of birds bought by Gray in 1846 for the Academy of Natural Sciences, Philadelphia.
(89) British Museum duplicates to Melbourne and Sydney through G. Krefft in 1860s.
(90) The Keeper of the Herbarium from 1844 to 1866 was William Henry Harvey (1811–1866), but there is now no record of a gift having been made.
(91) Dr John Macculloch, M.D., F.R.S. (1775–1835) chemist of the Board of Ordnance; minerals to Oxford, 1835.
(92) Robert McAndrew (1802–1873) collection of mollusca and marine invertebrates to Cambridge in 1873.
(93) The initiative for the formation of the Society came from Daniel Cooper, A.L.S., its first curator, and apart from the distribution of plants, it may be credited with three important works: H. C. Watson (1804–1881), *The London Catalogue of British Plants* (1844) and *Cybele Britannica* (1847–1859); and J. T. Boswell Syme (1822–1888), *English Botany*, Third Edition, 1863. The MS. of Gray's presidential address of 1836 is preserved in British Museum (Natural History) Zoological Department. MSS. 1835–1845: 45 f. unnumbered; ff. 1–11 (Gunther, 1975 : 77).
(94) Dr Hugh Falconer (1808–1865) in government service in India, Assam and Bengal and Captain (afterwards Sir) Proby T. Cautley (1802–1871) (Woodward, 1907).

(95) For Gray's sketch plans of foreign and British museums see British Museum (Natural History) Zoological Department. MSS. **45** : 1835–1845, ff. 22–34.

(96) In July 1846, Lord John Russell (1792–1878) had just been appointed Prime Minister and first Lord of the Treasury. The letter is filed in the British Museum (Natural History) Keeper's Room (Zoology): Foreign Letters, **2** : 214, 10 July 1846. Gray's hand-written draft will be found in British Museum (Natural History) Zoological Department MSS. **47** : 1844–1846, ff. 202–3.

(97) Edward Lear (1812–1888), G. C. Wallich (1815–1899) and John Gould (1804–1881).

(98) H.M.S. *Blossom*, 1825–1828; H.M.S. *Beagle*, 1832–1836; H.M.S. *Sulphur*, 1836–1842. H.M.S.s *Erebus* and *Terror*, 1839–1843.

(99) Gray is referring to his own contributions on the Mammalia (1844) and Reptiles (1845); of the work of a group of authors including Sir John Richardson (1787–1865) on Fishes (1844–1848) of *The Zoology of the Voyage of H.M.S.* ***Erebus*** *and* ***Terror*** *during 1839–43.* London, 1844–1875, 2 vols. (See Gray, 1875, item nos 277, 293).

(100) Getting into debt Salisbury was sentenced to the King's Bench prison, hence the phrase 'in the Bench' (compare Gunther, 1974 : 47 (note 39)).

(101) In his evidence on 2 June 1848 before the Royal Commission '. . . appointed to enquire into the Constitution and Management of the British Museum' (1850), para. 3346, Gray gives the years as 1814–1819, but the dates in the letter are more likely.

(102) J. J. Kaup (1803–1873), H. A. Hagen (1817–1893), T. Desvigne (1812–1868), W. S. Dallas (1824–1890), J. O. Westwood (1805–1893), T. V. Wollaston (1822–1878), G. Newport (1803–1854) also W. C. Hewitson (1806–1878) and F. Walker (1809–1874) (Günther, 1912).

(103) Antonio Panizzi (1797–1879), Principal Librarian, British Museum.

(104) See The Great Zoological Gallery, British Museum – Easter Monday, *Illus. Lond. News*, 11 October 1854 (Gunther, 1975 : 170 note 115).

(105) J. E. Gray married his cousin by marriage, Maria Emma Gray (née Smith), widow of Francis Edward Gray (1775–1814) who had purchased Eliot Vale Cottage, Blackheath. The Grays lived there until 1840 when they moved to the Keeper's Apartments in the British Museum at Bloomsbury.

(106) Either the Blackheath Mechanics Institute or the Greenwich Society for the Acquisition of Useful Knowledge.

(107) Sir John Bennett (1814–1897), Councillor of the Ward of Cheap and on London School Board; brother of William Cox Bennett (1820–1895), a minor poet, friend of Gray's, and secretary of the Greenwich Mechanics Institute.

(108) The Borough of Greenwich was enfranchised by the Reform Bill of 1832.

(109) Wicker ice-boat designed by Thomas Ritzler.

(110) Elected to the honorary office of Steward in 1851, for life.

(111) Leroy d'Etiolles (1798–1860) French surgeon of Paris. In another version Gray states that his attention was drawn to 'J. Leroy (d'Etoile's)' report by his naturalist friend, Professor A. Duméril in 1832.

(112) In 1835 the Society appointed a Medical Committee to consider the new method, and the credit appears to have been given to their surgeon, Dr John Dalrymple, see *Reports of Humane Society* for 1832–1840.

(113) The Municipal Reform Act of 1835 made it obligatory on local authorities to introduce public utilities such as water supply, sewage, gas, roads and housing.

(114) Dr John Richardson was appointed Chief Medical Officer to the new Melville Hospital at Chatham in 1828, and to the Royal Hospital at Haslar in 1838. In 1839 Dr John Conolly (1794–1866), a pioneer in the humane treatment of lunatics, was appointed to Hanwell.

(115) Sir Rowland Hill (1795–1879) on *Post Office Reform*, Reports 1837–1864.

(116) Known as the Mulready envelope.

(117) Gray, J. E., *A Hand Catalogue of Postage Stamps for the Use of Collectors*, London, Robert Hardwicke. 1862.

(118) *The Times*, 23 August 1853, which was followed in the next four years by some 30 letters and articles to various periodicals.

(119) There were many Select Committees and Royal Commissions on the question of decimal coinage from the 1820s onwards, but here Gray refers to the Reports of the Decimal Coinage Commissioners of 1856–1857 and to its Final Report of 1859, with appendices.

(120) Thomas Graham, F.R.S. (1805–1869), chemist, master of the Mint, 1855–1869.

(121) W. T. Brande, F.R.S. (1788–1866), mentioned previously, was at the time Chief Officer of Coinage at the Mint.

(122) Jeremiah Joyce (1763–1816), *Scientific Dialogues*, London 1809, 7 vols.

(123) Zerah Colburn (1804–1839), American mathematician prodigy.

(124) George Bidder (1806–1878), engineer.

(125) It was Gray's complaint that he never received the Royal Society's Gold Medal. For him to join a Dining Club was 'to do that nothing thing'.

(126) Gray could have cited, as an example, an almost exact contemporary (possibly a collateral), namely John Gray (1802–1888) born at Dudley, the second son of Thomas Gray, linen draper of High Street, Dudley. John Gray was a geologist of considerable local distinction, being one of the founders of the Dudley and Midland Geological Society and an honorary member of the Swedish Geological Society. Although there is no known connection between the two Grays, who must have known one another, John Gray of Dudley (and after 1850 of Hagley) seems to have shared the family characteristics. He was an avid collector, an evangelical churchman and ardent reformer (see obituary, in *Stourbridge Express*, 21 July 1888, p. 5; and also Woodward, 1907 : 164).

(127) William Sharpey F.R.S., (1802–1880), Professor of Anatomy and Physiology, University College, London 1836–1874.

(128) Novelists are not always, perhaps, the most truthful of writers. In 1861, a young man of 17, Arthur O'Shaughnessey, a 'nephew' of Lord Lytton, novelist and M.P., joined the staff of the Museum, much to the vexation of those for whom he worked, including Dr Gray. After one of the many incidents that came to the attention of the authorities, O'Shaughnessey, explaining matters to his Lordship, wrote:

> 'With regard to Dr. Gray, no opportunity is likely to occur of propitiating him, & I know by many experiences what the result would be. If I had to deal with an ordinary human being, such an interview, with the confidence and security that your words would inspire in me, could not fail of success: but Dr. Gray is impervious to such words as a wild beast in his den. He would not even hear one of them, as from the very first he has always stopped me with a savage unintelligible splutter of his own. He has a way of gnashing his teeth at me that would quite frighten even you My Lord! I always treat him with the utmost respect . . .' (Paden, 1964 : 24).

(129) Major General Thomas Hardwicke (1756–1835), of the East India Company, retired in 1823.

(130) Gray, J. E. 1830–1835. *Illustrations of Indian Zoology*. London. 2 vols. (See Gray, 1875, item no. 70).

(131) The Moravian Bretheren, so called, linked to the Lutheran Church.

(132) A member of the Broadwood family whose firm of piano manufacturers, founded in the eighteenth century, was flourishing in Gray's day, as it still is.

(133) The one outstanding collaboration between Gray and Darwin is recorded by A. E. Gunther (1979).

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